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The Illinois U Library

IRON AGE

JANUARY 27, 1949



WEAN

ENGINEERING

Company, Inc.
WARREN, OHIO

SPECIALISTS IN
SHEET, TIN & STRIP
MILL EQUIPMENT

WEAN
EQUIPMENT
Corporation
Cleveland Ohio

NARROW STRIP
AND WIRE MILL
MACHINERY

HOLMQUIST
BARBED WIRE
AND
WIRE FENCE
MACHINERY



As the white outline indicates, a standard unit of much greater frame size would be required to do the work of Speedaire.

Space Limited...used **SPEEDAIRE**

To operate this Coal Conveyor at a New Jersey aluminum plant, Speedaire was installed for these four excellent reasons:

1. Space was at a premium and demanded a right-angle worm-gear drive.
2. With the powerful, compact fan-cooled Speedaire unit, a further saving of space was obtained.
3. Speedaire reduced the weight on structural supports by 285 pounds.
4. Speedaire saved \$39.50 over the cost of a conventional unit.

Speedaire is Cleveland's new fan-cooled worm-gear speed reducer. Because it is fan-cooled, Speedaire will do more work—will deliver up to *double the horsepower* of standard worm units of equal frame size, at usual motor speeds. It can be installed economically on many applications where other types have been used heretofore—giving you the advantages of a compact right-angle drive. Speedaire gives the same long, trouble-free service characteristic of all Clevelands.

For full description, send for Catalog 300. The Cleveland Worm & Gear Company, 3252 East 80th St., Cleveland 4, Ohio.
Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.



CLEVELAND

Worm Gear

Speed Reducers

Kelly's Creek Colliery Company

solves a costly maintenance problem with

J&L HEAT-TREATED JALLOY STEEL

J&L STEEL



Unretouched photographs of the sluices in the McNally-Pittsburg Coal Washer at the Maiden Mine, Maidsville, W. Va. (Above) Sluices filled with fast-moving coal and water. (Right) Water flows over the exposed JALLOY plates.

Sluice-plates formerly replaced monthly . . .

Now heat-treated JALLOY plates last 10 times as long

Slide 300 tons of coal an hour—day in and day out—down the steel sluices of a coal washer, and you would expect the bottom plates to wear out rapidly. Kelley's Creek Colliery Company* considered monthly replacements quite normal for sluice bottom-plates—until they put in J&L heat-treated JALLOY Steel. Now they get 10 times longer service. This means lower maintenance cost . . . higher profits.

But that's not all! Conveyor sides and bottoms of mild steel generally lasted 3 months at the most. A year

ago JALLOY plates were installed . . . Present indications are that these plates will be in service at least another year before replacement is necessary. That will mean a minimum of 8 times longer service.

JALLOY is a heat-treated, manganese-molybdenum steel developed by J&L for just such uses as these—for resisting extreme abrasion and heavy shock.

Manufacturers and maintenance men, alike, find that JALLOY heat-treated plate makes equipment last longer. The outstanding wear-re-

sistant properties of this modern steel have been proved again and again in such applications as: Bulldozers . . . Scrapers . . . Rock crushers . . . Power-shovel buckets . . . Dump cars . . . Truck bodies . . . and Sand-blast equipment.

If abrasion is a limiting factor in the life of your equipment or products, you'll find it profitable to investigate JALLOY. Let us send you the booklet mentioned in the coupon.

Jones & Laughlin Steel Corporation
403 Jones & Laughlin Building
Pittsburgh 30, Pa.

☐ Please send me your booklet:
"JALLOY—J&L Alloy Steel."

☐ Do you recommend Jallo for:

Name
Company
Address

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY and JALLOY (hi-tensile steels).

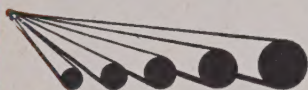
PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURALS AND PLATES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

PAGE

Stainless Steel

WIRE

ROUND



FLAT



OR



**Page for Wire—
Especially Stainless**

Remember that the next time you are looking for a responsible source for stainless steel wire. Wire has always been the business of PAGE. And PAGE has been working with stainless ever since its earliest development.

Whatever problem you may have involving wire—

*Get in
touch with Page!*

Monessen, Pa., Atlanta, Chicago, Denver,
Detroit, Los Angeles, New York, Pittsburgh,
Philadelphia, Portland, San Francisco,
Bridgeport, Conn.

ACCO



**PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE**

In Business for your Safety

Fatigue Cracks

BY C. T. POST

On Order

• • Bowed but not broken by the steel shortage, puckish Clem Caditz of Chicago's Northern Metal Products Co., again has been wielding his wicked sense of humor on the steel mills.

A Chicago steel mill sales official bustled into the office on his birthday, wreathed in smiles. On his desk sat an elaborate three tier birthday cake, lavish with four color icing and appropriate sentiments, compliments of Caditz. He called in his associates to admire the masterpiece, accepted congratulations. Then, ready to get down to work, he called his secretary to move the cake to a side table. The secretary couldn't seem to lift it. Then the sales official tried. He couldn't lift it either. Chipping off a bit of the frosting, he found that the entire cake structure had been welded together from quarter inch steel plate. Caditz finally broke down and admitted that two riggers had been required to get the "cake" delivered before working hours.

Despite the stand-offish attitude of the mills toward his orders, Caditz has not entirely given up hope. The other day, he set the shop to work making a 10 ft pole, tolerance ± 0.000 . His next order was dispatched to the mill sales office by messenger, who presented the pole along with the order. Attached was a note: "See if you can touch our order with this."

Our personal conviction is that any mill which fills a Caditz order is making a great mistake. With his appetite for steel satisfied, Caditz would play no more pranks. Life in the order department would settle down to its usual deadly dull routine.

No Bananas

• • E. I. du Pont de, etc., has a finger in almost every industrial pie in the country, seems like. Your favorite family journal's description in the January 13 issue (p. 57) of du Pont's new vitreous coatings for aluminum drew an immediate response from everyone but United Fruit Co.

According to your f.f.j.:

"Du Pont is supplying coarse fruits, pigments and a mill addition agent to be mixed and wet milled by the enameler."

"Probably over ripe, too," belays H. W. Abbott, who is probably jealous because du Pont's corpo-

rate name rivals in length his International Graphite & Electrode Corp.

And J. H. Benson, whose Mullins Manufacturing Corp. knows its frits, chimes in with, "Tricks in all trades, eh!"

To the brains department down the hall, which sponsored du Pont's new product, we are sending a bowl of Grape Nuts covered with apple sauce. Substituting the Grape Nuts for the frits, maybe they can come up with something brand new in the way of porcelain enameling—sort of a mottled surface. Another IRON AGE first!

Avant

• • The aforementioned Reader Abbott was only slightly slowed by du Pont's discovery. Reading ahead to European Letter (January 13, p. 90) he found:

"What is happening in Paris at present is the familiar spectacle of budget making."

Referring that one to the brains department, we were curtly informed that the French government, which has always had a tough time making ends meet financially, is doing better now that the Marshall plan is in force. Its budgets, with just a little bit more push, could properly be termed "re-spectable."

The whole steel industry, of course, was startled by President Truman's message on the state of the union, but not half so much as we were by your f.f.j.'s report last week (p. 101). The presidential message, the article said, "provided plenty of pyrotechniques for editorial writers and columnists from coast to coast." If the government is publishing a manual on "How To Become a Firebug," we don't think Truman should pass it along to the editorial writers. We have enough inflammatory journalism as it is.

Coast Report

• • Ben Berlien, the Chicago heat treating expert now cozily ensconced in California's frigid clime (Industrial Steel Treating Co., Oakland), still keeps up with what's going on back in civilization. He asks us to quiz the American Iron & Steel Institute on its statement in the December issue of *Steel Facts* that "New York City's early water mains were made from halloved tree trunks." That's New York for you. Nothing's sacred there.

Quick pay-off -- 2 case histories

Automatic drilling and tapping machines pay for themselves in 1 to 3 years by cutting costs of high production parts to pennies.

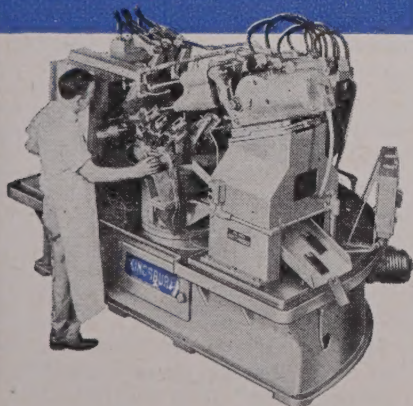
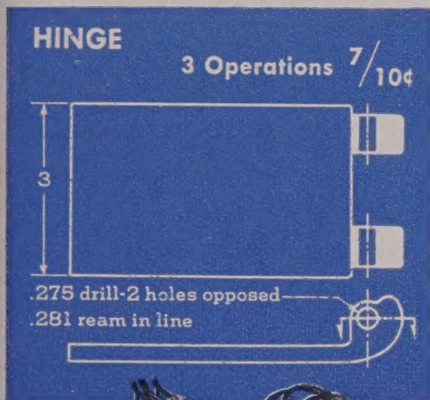
Dear Sir:

These 2 machines save money. That is the only reason for their existence.

They will pay for themselves in 1 to 3 years. Their owners, like all our customers, are impatient to get their investment back. If a Kingsbury's pay-off period ran over 3 years, they would keep on using their old equipment.

How automatic machines cut costs

Operations are in accurate location. (Bushings guide drills and reamers. One chucking instead of several.)



750 PARTS AN HOUR GROSS

While the man drops 3 hinges into nests, the machine clamps and drills 3 parts, reams 3 parts and ejects 3 parts down the chute. Then he presses a lever and the table indexes.

- 2 units drill from opposite ends at the left station. One unit reaches across the index table to drill from the rear.
- The rear unit reams both pin holes with a 6-inch stroke.
- Air cylinders operate levers to clamp the work automatically.
- All units have 3-spindle auxiliary heads to work on 3 parts at once.
- The machine can operate on similar hinges.
- Bushings guide the drills.
- An interlock prevents the table from indexing until every tool is withdrawn.

Parts are uniform. (Automatic cycles do not vary. Fixtures are identical duplicates.)

Saves floor space. Reduces handling.

But the real big reason is this: More output per man-hour. The operator chucks the work. The machine finishes the job. You can say this about a Kingsbury: Cost is low when production is high.

Sad to say, the opposite is also true. Cost is high when production is low. If you have a tough problem with accuracy or uniformity, a Kingsbury may still be a good investment. But if your production runs are short and you do not worry about accuracy, you might just as well turn the page.

Kingsburys do many different jobs

Jobs can be simple or complex — operations few or many, from one direction or several, simultaneous or successive. Holes can be from the smallest up to 1 inch (5 hp).

To find the most efficient setup for each job, we select from a complete line of standard equipment. Just look: 12 automatic drilling and tapping units with 82 standard attachments; 8 standard units and 18 standard bases. There are 4 basic types of indexing machines and 2 types that do not index.

What standard units do

Kingsbury units drill, tap, counter-bore, hollow mill, thread, spot face, ream, etc. Attachments mill light cuts in the same chucking with these operations. Multi-spindle auxiliary heads perform similar operations of about the same speed and feed.

How about sending us a print?

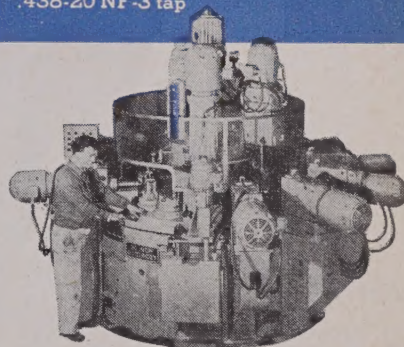
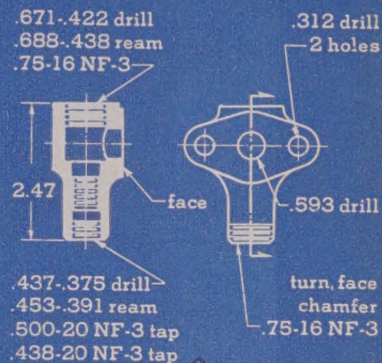
Let's get down to cases. Let us tell you exactly what a Kingsbury can do for you. Send us a print of a high production part and identify the operations and tell us the hourly output you need. If it is complicated, we'd like a sample part too. Our sales manager says it makes the job easier to visualize, but there is more to it than that. He leaves it on his desk; the general manager spies it; a sales engineer joins them. When the argument gets noisy we know they are working out something. You'd be surprised at the ideas they dream up that way. Some of them are darned ingenious.

Sincerely yours,
Kingsbury Machine Tool Corp.
70 Laurel St., Keene, N. H.

P.S. Here is the basis for costs in the case studies. 80% efficiency. Machine paid for after only 6000 hours, a fraction of its expected run. Wage rate above national average. No power or overhead included.

FITTING

12 Operations 1-9/104



605 PARTS AN HOUR GROSS

When the table indexes, every chuck rotates 180°. Horizontal units can then work on opposite ends of the fitting. While the man changes parts at the loading station, 4 vertical and 8 horizontal units operate on the parts at 11 working stations.

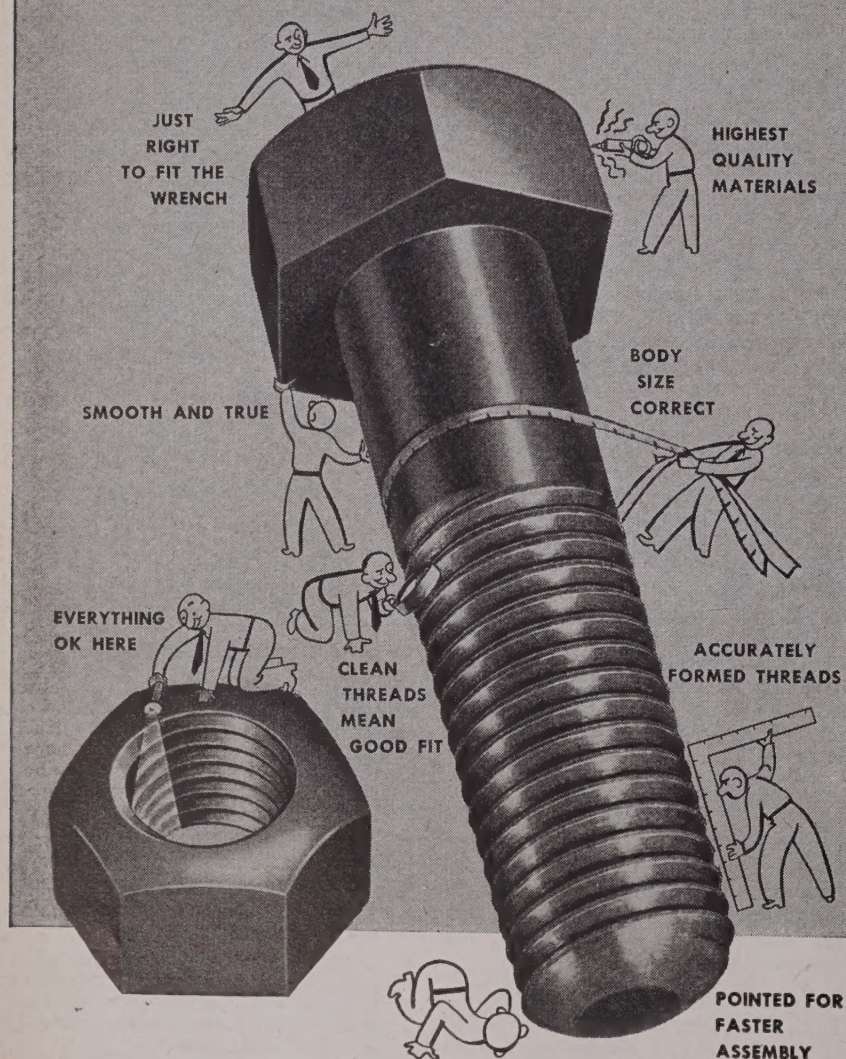
- A power wrench rotates a screw on each chuck to open and close it quickly.
- 12 self-centering two-jaw chucks are exact duplicates.
- Control is all-electric and meets Automotive Electrical Standards. Control devices are in a separate sheet metal cabinet away from the machine (not shown).
- A plexiglas splash guard hangs from the ceiling. The man lifts it to reach the tools.
- Bushing plates pilot onto locators on the chucks to align the tools.
- The column for the 4 vertical units is in the center so all tools are in easy reach. The working area is not caged in.
- Indexing can be automatic or under the control of the operator. He can jog the table part way for setting up or changing tools.

84

KINGSBURY

**AUTOMATIC DRILLING
AND TAPPING MACHINES**
for Low-Cost High Production

Turn *your* Inspectors loose on OLIVER FASTENERS ..



OLIVER Fasteners meet your most rigid specifications. Made under modern manufacturing conditions by one of the oldest firms in the industry, Oliver combines experience with skill to produce bolts, nuts, rivets and cap screws of highest quality.

For guaranteed satisfaction, specify OLIVER!

SEE YOUR DISTRIBUTOR!

OLIVER
IRON AND STEEL
Corporation

South Tenth and Muriel Sts. • Pittsburgh 3, Pa.

Dear Editor:

IMPORTED ORE PRICES

Sir:

We would be very grateful if you could give us information concerning the current prices for imported iron ores c.i.f. Eastern Atlantic Seaboard, including Swedish magnetite, and also any typical analyses of these ores which may be available.

ENOCH PERKINS
Vice-President

Mutual Chemical Co. of America
New York

● In cents per unit, c.i.f. Atlantic ports, Swedish basic (60 to 68 pct Fe) is 15.00 and Brazilian ore (68 to 69 pct Fe) is 19.50. These are the most recently published prices, but should be considered as nominal since no volume imports are being made. In general, Swedish magnetite runs from 60 to 70 pct Fe, is low in silicon and is of high purity. For analyses of Brazilian ores, tear sheets of the three-part article "Hills of Hematite" from the issues of Dec. 16, 23 and 30 have been mailed. Additional information on the Swedish ores can be obtained from Ekstrand & Tholand, New York. —Ed.

IMMERSION PYROMETERS

Sir:

We are interested in securing a copy of an article which appeared in the July 25, 1946 issue. We do not have the correct title, but the article concerned the use of immersion thermocouple pyrometers.

J. M. HOUSE
Librarian

Brown Instrument Co., Div. of Minneapolis-Honeywell Regulator Co.
Philadelphia

● The article was "Temperature Measurement of Liquid Steel." A copy is in the mail.—Ed.

TITANIUM

Sir:

Kindly send me tear sheets of the article "Physical Properties of Titanium Alloys" from the Dec. 30 issue. I would also appreciate another copy of the article "Symposium Helps Correlate Titanium Research and Development" from the Dec. 23 issue.

F. R. MORRAL
Associate Professor

Syracuse University, Dept. of Materials Engineering
Syracuse, N. Y.

● You will probably also find the article "Melting and Casting Titanium" in the Jan. 13 issue of interest.—Ed.

CUTTING TOOL METALLURGY

Sir:

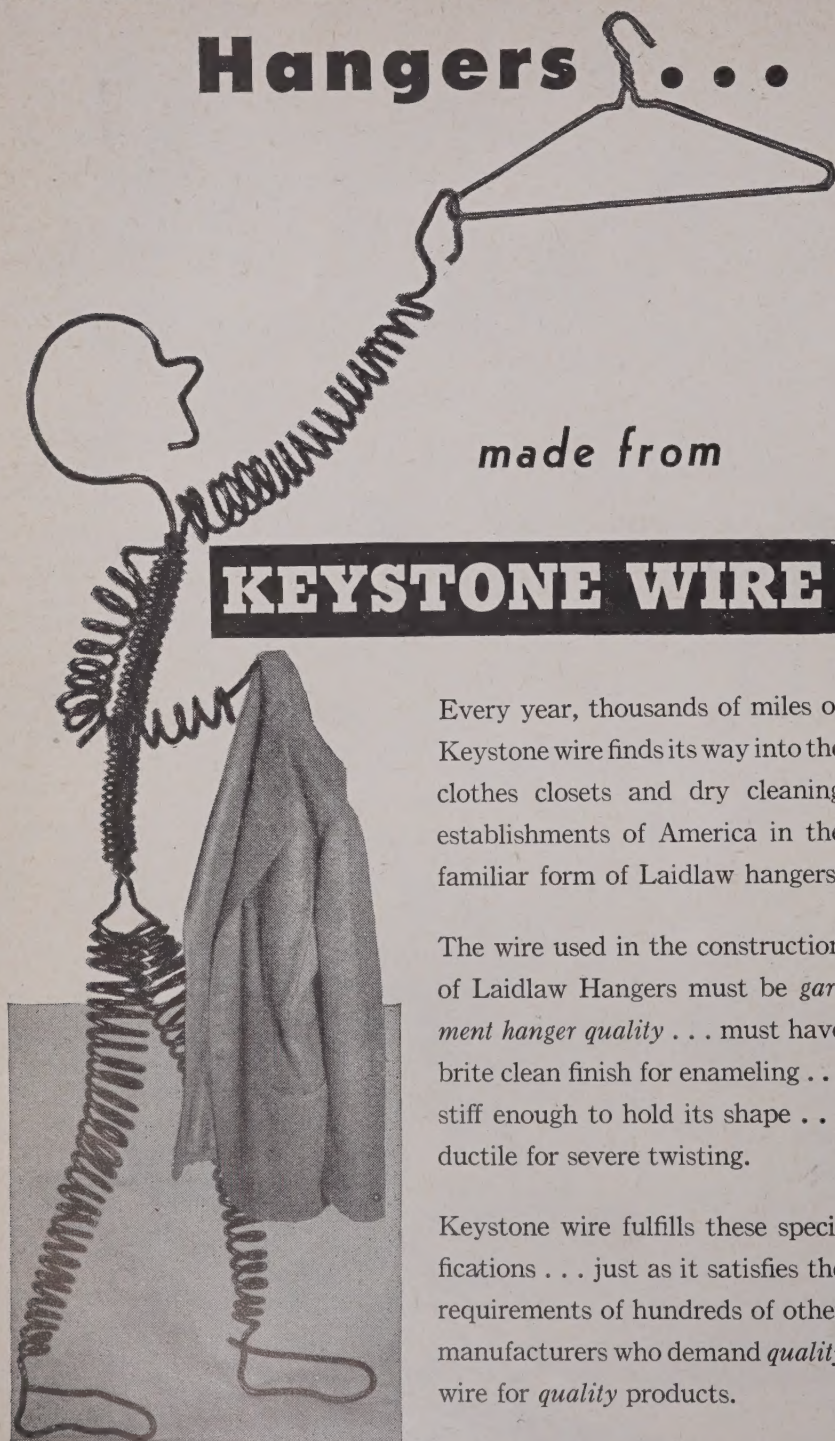
I have read with interest the article "Metallurgy and Heat Treatment of Cutting Tools" in the Dec. 30 issue. I understand this is the first part of a two-part article. I would appreciate receiving four tear sheet copies



ALL STAINLESS AND HEAT RESISTING ARC WELDING
ELECTRODES STOCKED. ALSO ELECTRODES TO MEET
SPECIFIC ANALYSES. COMPLETE FACILITIES FOR
COLD DRAWING, ROLLING, PICKLING AND ANNEALING

MAURATH, Inc. 21810 MILES AVENUE
CLEVELAND 22, OHIO

Millions of LAIDLAW Hangers . . . *



made from

KEYSTONE WIRE

Every year, thousands of miles of Keystone wire finds its way into the clothes closets and dry cleaning establishments of America in the familiar form of Laidlaw hangers.

The wire used in the construction of Laidlaw Hangers must be *garment hanger quality* . . . must have bright clean finish for enameling . . . stiff enough to hold its shape . . . ductile for severe twisting.

Keystone wire fulfills these specifications . . . just as it satisfies the requirements of hundreds of other manufacturers who demand *quality* wire for *quality* products.

*Laidlaw Wire Company
Peoria, Illinois

SPECIAL ANALYSIS WIRE
for all industrial purposes

KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS



of this article for my own use and for the use of the other members of my department, as I am sure it will prove of great value in our line of work.

GEORGE W. BROWN
Metallurgical Laboratory
International Business Machines Corp.,
Engineering Laboratory
Endicott, N. Y.

● The second part of the article appears in the Jan. 13 issue. Your four copies have been mailed.—Ed.

GAGE BLOCK ACCESSORIES

Sir:

Kindly send us four copies of "How to Make Best Use of Gage Block Accessories," published in the Dec. 23 issue.

R. E. MOULTON
Supt., Experimental Fabrication Dept.
California Institute of Technology, Jet
Propulsion Laboratory
Pasadena, Calif.

DIE SETTING

Sir:

The Nov. 18 issue contained an article "Die Setting and Economical Punch Press Operation." We would very much like to secure about 10 or 15 copies of this article for distribution among our die setters and would appreciate your letting us know how we may obtain them.

R. E. SHAFFAR
Purchasing Dept.
White-Rodgers Electric Co.
St. Louis

● Tear sheet copies are in the mail.—Ed.

TRADE NAMES

Sir:

We wish to purchase a copy of the Directory of Trade Names if it has been published separately. Will you please advise the price of copies so that we may issue a formal purchase order.

RACHEL MacDONALD
Librarian
Ford Motor Co., Engineering Laboratory
Dearborn

● For one or two copies, the charge is \$3.00 each. Three to nine copies are \$2.50 each, and in larger quantities, \$2.00 each.—Ed.

SHIPWRECK SCRAP

Sir:

We have an inquiry pertaining to the price for scrap iron from shipwrecks, and would appreciate it very much if you would kindly furnish us with information about the present prices of scrap iron, c. i. f. New York or any other eastern port.

LORENZ PETERSEN
Vice Consul
Danish Consulate General, Commercial
Section
New York

● A tear sheet from the current issue showing broker's buying prices per gross ton for scrap iron and steel, on cars, New York, has been mailed. These prices are for prepared scrap—segregated as to type and grade, and cut to the sizes required. The cost of undertaking this preparation and segregation

(CONTINUED ON PAGE 46)

ZERO TO 94,000 LBS. TO ZERO
in 1/30th second

... as water strikes these turbine buckets

Water, traveling 375 feet per second, imparts its energy to these turbine buckets at pressures reaching 47 tons per impulse. Add centrifugal forces and the erosive and corrosive effects of the water, and you realize why Allis-Chalmers Manufacturing Company sought stronger, longer-wearing materials for this use.

Buckets on this water wheel were fabricated from steel plate shapes produced at By-Products Steel Co. Service records on similar buckets show that these plate products have much longer life than cast buckets. Down time on Allis-Chalmers turbines has been reduced by their use, therefore.

Pressed steel products like these, made by By-Products Steel Co., are accurate in size and contour, requiring very little finishing. Plate products have the advantage that they are uniformly high in strength, dependable and safe.

Bulletin 270 illustrates the type of work done at By-Products Steel Co., Division of Lukens Steel Company, 413 Strode Avenue, Coatesville, Penna.

"STEEL SHAPES FOR INDUSTRY", a 16mm motion picture in sound and color showing flame-cutting, bending, shearing, pressing, blanking and otherwise forming steel plate shapes, is available without charge. Running time: 20 minutes. Write for a booking date.

Pressed steel plate shapes, produced by By-Products Steel Co., form the bucket bowls for this Allis-Chalmers water turbine.



BY-PRODUCTS STEEL CO.
STEEL PLATE SHAPES

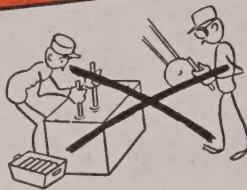
FLAME-CUT ★ SHEARED ★ PRESSED ★ BENT ★ BLANKED ★ WELDED

GOOD NEWS FOR METAL-WORKING PLANTS

Faster Production



Speedy, localized induction heating cuts heating time to seconds.



Often eliminates copper-plating, packing, carburizing, straightening and extra machining operations.



Compact, clean machine can be located close to related operations to avoid hauling.



Set-up changes for different parts are easily and quickly made.

Lower Costs



Slashes man-hours. Skilled labor not required.



Banishes rejects due to distortion. Saves wear on dies caused by scaling in forming applications.



Often eliminates need for costly alloys in product.



Saves floor space. Improves working conditions.

with **TOCCO*** Induction Heating

IF you are concerned with the profit and loss figures of your company don't overlook the cost-cutting possibilities of TOCCO Induction Heating. America's leading metal-working plants have found that TOCCO can speed production and lower unit costs in hardening, heating for forging and brazing applications.

Look how **NASH** did it

PRODUCTION TRIPLED! UNIT COST CUT 60%



Nash oil pan showing TOCCO-Brazed drain flange. Photo courtesy Nash Motors.

with **TOCCO*** Induction Heating

Even if your products are entirely different in size and shape TOCCO can probably provide similar cost reductions and production increases for you.

● *Nash Motors, Kenosha, Wisconsin* reports the following benefits from TOCCO Induction brazing of drain flanges to automobile oil pans:

1. PRODUCTION TRIPLED — Using a hand torch, production was only 21 brazed assemblies per hour. TOCCO brazes 75 per hour—357% of former output!

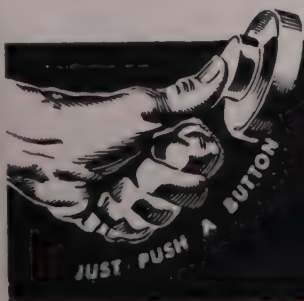
2. COSTS CUT — At the same time TOCCO Induction brazing cuts labor and material costs from

\$12.75 to \$4.90 per hundred—a reduction of 60%, representing a saving of \$6.00 every hour.

3. OTHER ADVANTAGES—include a neater, better looking brazed joint, and a complete elimination of leakers and subsequent repair costs.

TOCCO Engineers are glad to help you find applications in your plant where TOCCO Induction Heating can increase your production, cut your costs and improve your products.

THE OHIO CRANKSHAFT COMPANY



TOCCO

*Trade Mark Reg.
U. S. Pat. Off.

FREE
BULLETIN

Mail Coupon Today

THE OHIO CRANKSHAFT CO.
Dept. A-2, Cleveland 1, Ohio

Please send free copy of 40 page book
"TOCCO Induction Heating"

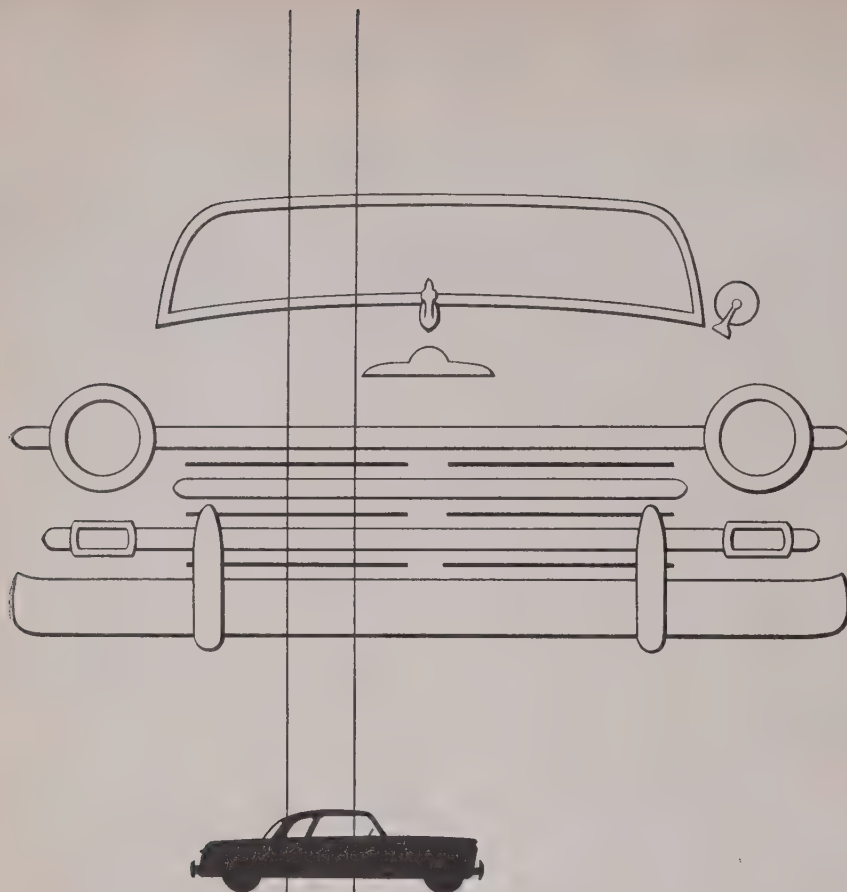
Name

Position

Company

Address

City Zone State



for cleaning parts
to be chrome-plated

USE WYANDOTTE NO. 90

Wyandotte No. 90 is a high-conductivity, reverse current electrocleaner with remarkably good tolerance to chrome contamination. It removes smut and fabricating compounds from ferrous parts efficiently and thoroughly, thus helping to assure bright, cloud-free electroplates.

No. 90 is especially valuable in automatic equipment where parts are not reracked before going into chrome plating. Wyandotte No. 90 solutions tend to eliminate plating difficulties caused by the drag-over of trapped chrome-plating solution.

Other advantages of this heavy-duty cleaner are its controlled foaming and long life in solution. Special ingredients in No. 90 condition the water in the cleaning bath and improve rinsing action.

No matter what your metal-cleaning problems may be, you'll find the answers in the complete Wyandotte line. For detailed information, simply call your nearest Wyandotte Representative.



WYANDOTTE CHEMICALS CORPORATION
WYANDOTTE, MICHIGAN • SERVICE REPRESENTATIVES IN 88 CITIES

tion would vary according to the size, condition and structure of the shipwrecked vessel.—Ed.

NONFERROUS ALLOY SPECS

Sir:

A few years ago a small booklet was reprinted from *THE IRON AGE* giving the nonferrous alloy specifications by ASTM, Aeronautical Material, U. S. Army, U. S. Air Corps, U. S. Navy and SAE standards. We should very much like to have one of these booklets if it is at all possible.

W. H. BITNER

Scovill Mfg. Co.
Sturgis, Mich.

● Copies are 25¢ each. One has been mailed to you.—Ed.

BAR MILLS

Sir:

We have been attempting to secure a source of supply on a special bar section. We prefer to buy our own rolls for this section. It is approximately $1\frac{1}{2} \times \frac{1}{4}$ in., with an extruded rib on one side increasing the elevation approximately $\frac{1}{8}$ in. Can you suggest an independent bar mill that might be interested in from 200 to 500 tons on an item of this kind?

F. A. HENNINGER
Vice-President

Rulane Tank Co.
Charlotte, N. C.

● The addresses of several companies which might be interested have been sent.—Ed.

FRICION SAWS

Sir:

In the Dec. 23 issue we noticed a photo of high speed friction saws which have been installed in U. S. Steel Corp. warehouses. We would appreciate having further information on these machines and if possible the name of the manufacturer so that we can secure figures on price and delivery.

F. L. HAVILAND
Vice-President & Gen. Mgr.

Standard Steel Construction Co.
Welland, Ontario

● Further information on the saws has been sent. J. W. Cushing, U. S. Steel Supply Co., Chicago, will give you the name of the manufacturer.—Ed.

COLOR METALLOGRAPHY

Sir:

Will you please furnish three copies of "Color Metallography" which was published in the Oct. 7 issue.

J. F. COULTIER
Research Laboratories

Bendix Aviation Corp.
Detroit

EMPLOYEES AND PERSONALITIES

Sir:

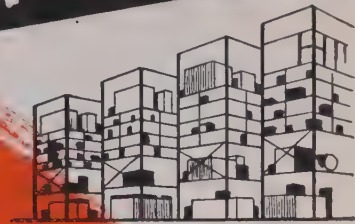
The article "Personality Factors in Future Employee Selection" in the

WHAT DO YOU NEED?

— BUT QUICK!



LOCKERS



SHELVING



SHOP EQUIPMENT



TOOL ROOM EQUIPMENT



SPECIAL CONTRACT ITEMS
TO YOUR SPECIFICATIONS



FOLDING CHAIRS

YOU FURNISH the STEEL LYON WILL MAKE the PRODUCT



FILING CABINETS



CONTRACT PRODUCTION



KITCHEN CABINETS

• We can make prompt delivery on LYON Products if you will furnish us with the sheet steel. We will buy the steel from you and ship the pound-for-pound equivalent in either standard LYON Products at

regular published prices (see partial list below) or special items made to your specifications.

Ask your nearest LYON Dealer or LYON District Office for details of the "Customer Steel" plan.

A PARTIAL
LIST OF
LYON
PRODUCTS

LYON METAL PRODUCTS, INCORPORATED

General Offices: 136 Monroe Avenue, Aurora, Illinois
Branches and Dealers in All Principal Cities

- Shelving
- Lockers
- Wood Working Benches
- Economy Locker Racks
- Kitchen Cabinets
- Display Equipment
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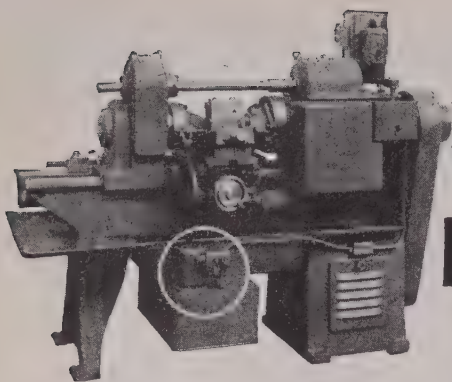
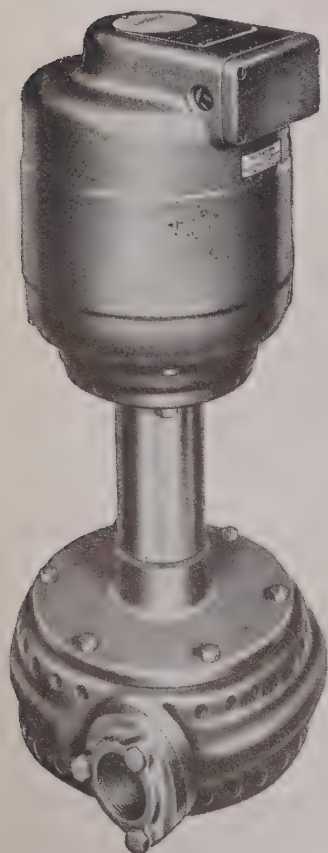


Photo Courtesy The R. K. LeBlond Machine Tool Co. showing a LeBlond #1 Crankshaft Lathe with 1/10 HP Model I-P3 Gusher Coolant Pump.



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Nov. 11 issue seems especially interesting and I would like very much to have a copy to retain for my file.

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Div. Columbus McKinnon Chain Corp.
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TEACHING AIDS

Sir:

Copies of the following articles would be valuable to us for instructive purposes: "Hardness Testing of Soft Metals," June 24 issue; "Continuous Casting," Feb. 24, 1944 issue; "Continuous Casting of Semi-Finished Steel," Aug. 19 issue; "Continuous Casting by the Asarco Process," Aug. 26 issue; and "New Temper Designations for Aluminum Alloys," June 24 issue.

R. R. NASH
Instructor

Rensselaer Polytechnic Institute,
Dept. of Metallurgical Engineering
Troy, N. Y.

ELECTRODE SPECIFICATIONS

Sir:

We would appreciate receiving, for the use of our technical section, tear sheets of "New Welding Electrode Specifications" from the Oct. 28 issue, and "New Steel Features High Strength and High Toughness" from the Oct. 21 issue.

L. T. JILK
Manager, Technical Sect.

E. I. duPont de Nemours & Co., Inc.,
Sabine River Works
Orange, Texas

MISUNDERSTANDING

Sir:

As the result of the Newsfront item in your Nov. 4 issue concerning a statement made by this company, we have been placed in an awkward position with our sources of steel supply. The item gave the impression that we are getting as much steel as we require, which is not the case.

Only today, one of the representatives of a large mill from whom we were receiving some steel asked what we were "beefing" about. His sales manager had called his attention to the few lines that appeared in Newsfront, and told him that Cole Steel seemed to be getting enough steel from somewhere.

As a matter of fact, only recently we were forced to lay off 150 men because of the lack of sheet steel.

S. T. SCHEINMAN
President

Cole Steel Equipment Co., Inc.
New York

● Our apologies. The meaning intended in the item was that while the company was not getting all the steel it required, it felt that the steel mills were handling distribution as fairly and as satisfactorily as possible.—Ed.

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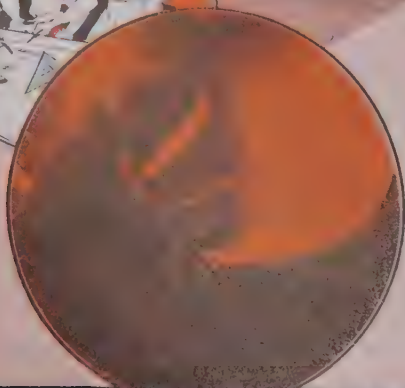
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Nationalization

IN his message on the State of the Union the President served notice on the steel industry that it was in danger of nationalization. The stated reason? Under present private management the steel makers were not turning out enough steel to satisfy the needs of this country and fulfill its high policy commitments to other countries.

We believe this to be a cynical and deliberate misrepresentation of the real reasons. However, let's look at the logic which the public was asked to accept.

The steel industry in the year just passed produced 88.5 million tons of ingots, a fair measure of practical capacity. This was achieved in spite of a loss of 1.6 million tons due to a coal strike. The figure may be compared with an output of 52.8 million tons in 1939. It actually exceeded the average output of the war years.

As Iron Age has pointed out, the cost of adding a ton of steelmaking capacity is currently about \$300. Established capacity is carried at an average book cost of \$52 a ton. Enders Voorhees, the Chairman of the Finance Committee of "Big Steel," in his testimony before the Flanders Committee stated that the corporation was now earning approximately six per cent on its sales although operating at more than 90 per cent of capacity. This is the profit margin which in the past has prevailed at operating levels of 40-50 pct. In spite of the high cost of added capacity and depression on profit margins, the industry in the two year period 1948-49 will increase its capacity by more than 5 million tons.

Also pertinent is the fact that this country accounted for 52 pct of the world's total output of steel in 1948, that it is currently producing at a rate 2.3 times the combined total of Russia and England. No one has suggested that the industry is inefficient, that it is holding back production or that it has failed to produce the maximum tonnage which circumstances permit.

Among these "circumstances" which have a bearing on the problem have been strikes that have accounted for a loss of 20 million tons of steel in the postwar period. The presidential complaint contained not a word of reproach for the labor leaders who in their search for personal power deliberately precipitated stoppages which aggravated the scarcity of steel. One must assume from this failure that the industry is obliged to create a capacity, irrespective of costs and labor interruptions, which will provide, at a price considered reasonable by the government, all the steel which the country needs.

On this point the message of the President reveals an ignorance which has long since ceased to be surprising. Any elementary student of economics knows that absolute scarcities in economics are as rare as vacuums in nature. When the market is free to do its own bidding, without the aid of the political horror boys, prices automatically reflect the relationship of supply and demand. The very existence of gray markets in steel shows that quoted prices are unreal, that they are a forced concession to political pressure. If steel were permitted to find its natural price level the present "scarcity" would vanish.

By intimidating the industry and compelling quoted prices which do not fairly reflect costs and risks, the government is creating the very "scarcity" which it is now using as the pretext for possible nationalization.

Joseph Stagg Lawrence

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METALLURGY SALES OPERATIONS

- Experiments in making pig iron with noncoking quality coal have shown encouraging results in Germany. A German-French company has been formed to determine whether the process is practical on a production basis. In short, iron ore is mixed with briquetted noncoking coal which has been subjected to low temperature carbonization. The mixture is then melted down in a low stack furnace. If proven practical in production, pig iron could be produced at a unit without having coke oven or blast furnaces.
- Government sources say advance notice concerning the possible cutting off of Russian exports of manganese might prove to be a boon. Given a year at the most, say these sources, any manganese deposits in South Africa, India, and South America will be developed to a point where Russia will no longer be an important factor in the U. S. picture.
- At one auto engine plant, when cylinder bores in blocks are gaged, the bore sizes are teletyped to an assembly point where a set of pistons to fit each bore is selected and placed on a tray along with mating piston pins and rods. Later, this tray meets the block of the same number at the assembly station.
- Investigations on the machinability of titanium have revealed that, except for sawing, the material machines about the same as stainless steel. The work hardening characteristics of the metal and its tendency to load saw teeth make sawing difficult. Sawing takes about five times as long for titanium as it does for stainless.
- If labor gets nothing but social security and pension advances this year, a bolstering effect is expected on morale, efficiency and spending habits. Personnel men say that partial or complete elimination of fear of sickness—with lost wages—and old age without security goes a long way for better morale, better efficiency and more spending for consumer items.
- Service life of switch plates for fractional horsepower motors has been lengthened by coating the skillets with porcelain enamel. In another application, special corrosion resistant porcelain enamels are being used as coating for pipe and fittings in the rubber industry. Many man hours of cleaning time are reported saved by using the easily cleaned, rust preventative coatings.
- One large western railroad is experimenting with jet brakes. If successful, the brakes will be used on fast diesel trains where friction on the shoe and between the rail and the wheels is inadequate to stop high speed trains. A diesel locomotive maker is actively participating in the development.
- Timmins-Hanna interest in Quebec-Labrador iron ore will start construction on the 350-mile railroad from Seven Islands to Burnt Creek when commitments for iron ore are obtained from steel firms in this country. There is no truth in the rumor that the Province of Quebec will build the railroad to the ore project.
- New England is determined to expand its steel producing facilities. Big power behind the effort is the New England Council. Their weapon is a host of statistics showing the advantages of more steel output in New England. Problem now is to convince one of the large steel companies. Conference with one large steel producer was held this week. Conference with another big producer is scheduled for near future. Others will be held. Arguments will center on two main points: (1) Availability of raw materials and (2) presence of a protected market as a result of f.o.b. mill selling.
- Some processing equipment of DuPont's celanese plant in Bishop, Tex., built of stainless steel 2 years ago, is falling apart. The company is considering replacing the corroded out stainless parts with aluminum bronze.
- Innovations in porcelain enameling technique incorporated into production of the Lustron house include the use of ordinary cold rolled steel sheet stock instead of enameling stock. Firing temperatures are 1300° F instead of the normal 1500° to 1600° F.
- Improved die design has cut auto production and inspection costs measurably. One plant is producing 12,000 wheels a day but requires only two inspectors. A few years ago several times as many inspectors would have been required.

Casting Stainless Steel



By HERBERT J. COOPER

*Engineer,
Research & Development Dept.,
Cooper Alloy Foundry Co.,
Hillside, N. J.*

TYPICAL examples of high alloy rings cast centrifugally in permanent metal molds. The larger rings are $27\frac{5}{8}$ in. OD and weigh 450 lb as cast.

ALTHOUGH American foundries have been casting centrifugally for a number of years in sand, iron and steel molds, the use of this method to produce on a mass production basis the high alloy castings required for jet engine rings is a recent development.

Impetus for developing the techniques requisite to the casting of stainless steels by pouring the molten metal into a spinning metal mold arose from the necessity of making cylindrical engine components for the JT-6B Turbo-Wasp, American version of the famous Rolls Royce Nene.

Centrifugal casting can be divided into three broad categories—centrifuging, centrifugal pouring and pure centrifugal casting.

Centrifuging provides a method of obtaining a greater pouring pressure in the risers of a casting without increasing the height of the riser. This is accomplished by grouping several castings around a central gate and rotating the entire mold. The action of centrifugal force produces an acceleration and consequently a pressure at every point within the casting proportional to the square of the rotational speed and the distance to the point from the axis of rotation. This method is generally restricted to castings of small and rather complex shapes where feeding is a problem.

Centrifugal pouring is used in producing castings of symmetrical shape relative to the axis

of rotation. The gate is generally placed on the axis and the action of centrifugal force causes the metal to flow outward into the mold cavity. This method is well adapted to the production of castings with thin metal walls.

Centrifugal pouring was used at the Cooper Alloy Foundry Co. during the war to produce nozzle diaphragms for aircraft turbosuperchargers. Over 75,000 castings of this type were produced with a remarkably low rejection rate.

The pure centrifugal casting process not only involves the feeding of the casting by centrifugal force, but also the shaping of it. Although pipe and bushings have been cast this way in sand molds, the first important use of this process in metal molds was, as was cited previously, stimulated by aircraft requirements.

From a metallurgical standpoint, the advantages of centrifugal casting had long been known. Tests had shown that the centrifugal action tends to drive the heavy metal outward, while the lighter inclusions, such as slag, dirt and gas, move inward. This separation of the inclusions from the metal results in denser and sounder castings. It was also known that the rapid chilling induced by solidification of the molten metal against a heavy metal wall produced a fine-grained metal structure with improved physical properties.

The high degree of cleanliness and the high

Centrifugally

—In Permanent Metal Molds

Development of techniques for the centrifugal casting in permanent metal molds of high alloy steel is described by the author. Developed primarily as a means of meeting the rigid requirements of large rings used in the Nene jet engine, the process holds promise for many industrial applications such as pump liners, seat rings and other cylindrical shapes.

physical properties demanded by the aircraft industry in the design of the new jet engines offered just the chance for which foundry research staffs had been waiting—the chance to check theoretical knowledge against production actuality.

When arrangements were made to transplant production of the famous Nene engine to American soil, Cooper Alloy Foundry Co. was awarded by Pratt & Whitney Aircraft the first contract to produce the high alloy cylinders from which the vital rings were to be machined.

The cylinders to be cast ranged from 8 to 30 in. diam and weighed from 50 to 500 lb. The heat resistant alloy specified contained approximately 24 pct Cr, 12 pct Ni, and 3 pct W. The finished rings were required to meet rigid physical and metallurgical standards. Examples of these rings are shown in fig. 1. The largest ring in this illustration measures $27\frac{5}{8}$ in. OD, has a 2 in. wall (as cast) and weighs 450 lb as cast.

Although Cooper Foundry was equipped for both horizontal and vertical centrifugal casting, it was found that vertical spinning adapted itself most easily to mass production. In the initial design cast iron was used in the mold construction, but later developments led to the use of alloy steel, particularly for the larger molds.

In producing the rings, the heat resisting alloy is melted in an electric furnace, with ex-

treme care being taken to assure the specified composition and to satisfy established quality melting standards.

FIG. 1—Pouring a weighed quantity of metal into a spinning metal mold, with the protective shield in place.



In view of the fact that in the pure centrifugal method the OD is fixed by the metal mold, while the ID is dependent upon the amount of metal poured rather than on a core, it is essential that weight control measures be adopted. The metal is tapped from the furnace into a large ladle and is then poured into a smaller ladle and carefully weighed.

A long series of experiments have established sufficient tabular data showing the relationship between the weight of the metal and the resultant wall thickness. Variations in the ID from the top to the bottom of the casting were bound to be dependent upon the speed of rotation, and experiments were conducted to determine the specific speeds required to achieve uniform wall thickness.

After being poured (see fig. 1), the hot casting is extracted from the mold by means of a set of tongs attached to an electric hoist, as shown in fig. 2, and the thin fin of metal which covers the bottom of the casting is knocked away with a hammer. The circle of contact of this fin with the casting is smoothed with a swing grinder and the casting is then heat treated to required physicals. After turning to remove rough surface scale, the castings are X-rayed in Cooper's X-ray department. Those castings whose wall sections are too thick to allow effective X-ray are subjected to gamma radiation. When the rough castings have met all the inspection requirements of the foundry and the laboratory, they are shipped to Pratt & Whitney Aircraft where they are sliced and

machined into the engine components. They are again X-rayed to assure highest possible quality.

Under theoretical conditions, the solidification of molten metal poured in a metal mold should proceed from the mold surface inward, with the outer layer of metal freezing upon contact with the mold wall and the interior layers freezing at a slower rate as the heat transfer path through the casting to the mold becomes longer. Thus, the center sections of the casting will be molten some time after the outside is solid and the center of the casting will feed the outer sections under the influence of centrifugal force. Under actual conditions, however, it was found that a small amount of heat was transferred from the ID of the casting to the central air pocket. This caused a thin shell of metal to form on the ID, with the result that feeding of the outer sections caused shrinkage within the casting itself. This was a cause for rejection of the entire cylinder.

To overcome this it was necessary to minimize the heat transfer to the center air pocket. This was accomplished by using exothermic and insulating material of lower specific gravity than the metal. This method effectively stopped heat transfer to the air pocket and allowed "theoretical" solidification to proceed.

Initially, the molten metal was poured directly against the bare metal wall. The resultant instantaneous chilling of the outer surface and its rapid contraction caused large cracks and even tears to appear. These cracks ran vertically along the entire height of the casting and made the casting worthless. It was thought that if the initial chilling action could be somewhat slowed to allow a more even solidification around the circumference of the casting this condition could be eliminated. Therefore, it

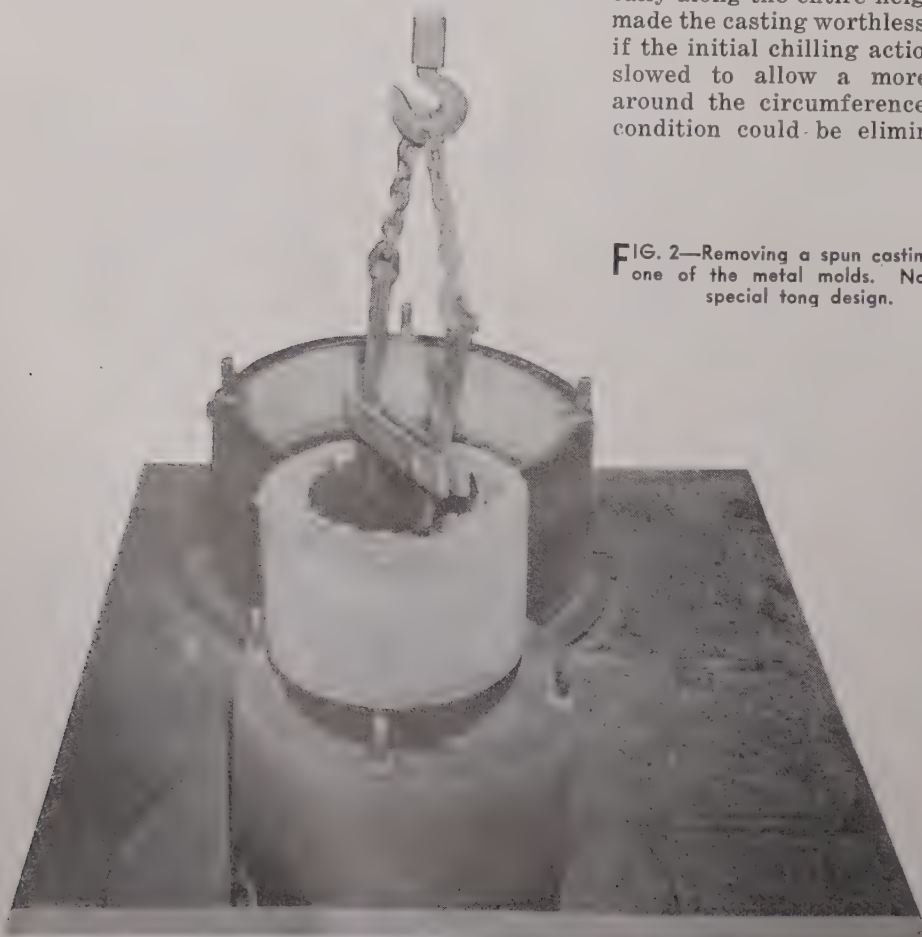


FIG. 2—Removing a spun casting from one of the metal molds. Note the special tong design.

FIG. 3—Assembling covers on two of the metal molds. Both the mold interior and the covers have been sprayed with a silica wash.



was decided to spray the side walls of the mold with a fine silica (see fig. 3) wash. Further experimentation disclosed that as the depth of wash was increased, the tendency toward cracking was decreased and the surface quality of the casting improved.

Once the problems of shrinkage and cracking were under control, daily production runs were started. One of the first difficulties noted was connected with the extraction of the casting from the mold. It was found that occasionally the fin of the casting fused to the bottom of the mold. This necessitated hammering the casting with a sledge to release the fin. Not only was this detrimental to the mold, but it proved a waste of valuable production time. A thin layer of silica wash was tried on the bottom to prevent this sticking. This was not successful because the metal impinging upon the film caused the wash to be entrapped in the metal, a condition which was considered unsatisfactory on X-ray examination.

The problem was finally solved by inserting a machined steel plate in the bottom of the mold. Thus, if the casting did stick, both the casting and the false bottom were removed from the mold and another plate inserted in time for the next heat. In this way production quotas could be maintained and damage to the mold could be prevented.

It was indicated previously that initially all molds were made of cast iron. Originally, the machining of the molds was limited to facing the bottom and the inside surfaces. This failure to machine the outside surface of the molds led to serious vibration which in turn was another source of cracking. Subsequently, all molds were machined on the outside, and both the inside and outside surfaces were made concentric.

As these molds are relatively expensive, with

the cost varying with the size, the cost of production work is greatly influenced by the expected mold life. Original estimates were based on a mold life of 50 heats. This was excellent for the smaller size molds, with some molds lasting for 100 heats; but for molds with inside diameters over 20 in., immediate difficulties were encountered. Failure occurred at the bolt holes, where the incessant heating and cooling action caused vertical cracks to appear. Considering that the mold cost was directly proportional to the mold size, and that the seriousness of these failures increased as the mold size increased, it is obvious that this presented a serious production problem.

As a solution, it was decided to cast the larger size rings in steel molds. Following a series of test runs the decision was made to standardize on 4130 alloy steel. The use of steel molds brought up the problem of how to anchor the cover to the mold, since steel bolts are prone to freeze in steel when heated. A set of slotted studs was made up and screwed into the mold. The cover was then dropped on and wedge-shaped steel pins were hammered into the slot. After a few heats the studs became integral with the mold and production runs soon proved that the use of these studs saved several minutes in the set-up time and proved highly economical.

The Cooper Alloy Foundry Co. has been pouring stainless and heat resisting castings centrifugally in permanent molds on a production basis since October, 1947. It is the opinion of this company that this process will some day play an important role in the American industrial scene, because it is ideally situated for applications such as pump liners, seat rings, valve guides and numerous other castings of cylindrical shape.

An Analysis of Prices, Wages and

By GEORGE H. BLACKETT

and

ALVIN MAYNE

New York

THE average hourly earnings of steel industry workers have risen 12 pct within the past year, with a large part of this gain occurring during the month of July 1948. The resultant rise in labor costs of the steel industry has been accompanied by an increase in other operating costs. The industry is producing close to its capacity and has done so for some time. There have been advances in the prices of finished steel. THE IRON AGE composite steel price stood at 3.75255¢ per lb on Sept. 28, 1948, as compared with 3.18925¢ a year ago. The steel industry claims that the increases in prices for finished steel products have been necessitated by higher costs. Others claim that the rise in steel prices has not been justified by the increased costs. Steel is basic to so many manufactured products that the price rise for finished steel has unquestionably contributed to higher prices on many goods consumers buy. Because of widespread interest, it would appear to be of value to the public, to labor, and to the steel industry to determine the answers on an industry-wide basis to several fundamental questions:

(1)—How much does any given pay rise in the steel industry add to the steel payroll at varying levels of finished steel output?

(2)—How much does the associated increase in total labor costs add to the industry's cost of goods sold at varying levels of production?

(3)—How much does any given price increase per ton for finished steel add to the dollar sales of the entire steel industry at various levels of finished steel output?

(4)—What is the effect of a given increase in raw materials prices on the industry's cost of goods sold?

Without simple, quantitative answers to these questions one has no right to judge whether the rise in price for finished steel compensates for the increased costs growing out of higher pay to wage earners, nor has one a basis for expressing an opinion on this topic. The answers to these questions should also throw light on the probable effects of a decline in the business cycle when such an event develops.

There are two methods that can be followed in determining the answers to these fundamental questions. The first is an accounting method. Individual companies can build a very reliable estimate from their accounts of the effect of changes in wage payments, in costs, and in price upon their gross operating profits. Undoubtedly, most companies have such compilations assuming different levels of output. Unfortunately sufficient accounting detail is not available for the industry as a whole, and, in addition, the accounting approach lacks flexibility to allow for various combinations of conditions. In the steel industry especially, changes in the level of production have a major effect in terms of costs and a false assumption with respect to output is apt to nullify an accounting solution to the problem.

The second possible approach to answering the four fundamental questions is by a statistical method. It is less exact than an accounting calculation, but is much more readily derived and is useful as a short cut that achieves much greater flexibility because any combination of the factors involved can be used. It is the only approach that is feasible on an industry-wide basis where exact accounting data are missing. It also serves as a quick check for individual companies against the more tedious accounting procedure, as well as

Costs in the Steel Industry

The current interest in steel industry profits and selling prices lends particular emphasis to the method proposed by the authors for evaluating the effect of changes in wage rates, raw material costs or selling prices on the gross profits of the steel industry. The method described, involving comparatively simple statistical analysis of readily available data, shows a high degree of correlation with past experience.

forming the ground work for an investigation of break-even points under a wide variety of circumstances.

On the basis of statistical analysis of industry operating data covering a period of two decades, the authors have established relationships among prices, sales, cost of goods sold, payrolls, raw material prices, and the level of operations. From

these relationships, which are expressed as a series of mathematical equations, it is possible to develop quantitative answers to the four questions previously stated. These equations are applicable to a variety of economic situations inherent in various phases of the business cycle.

For the 1947 calendar year, the American Iron & Steel Institute reports net billings by 92 pct or

TABLE I

Equations Derived in a Study of Steel Industry Profits

- To estimate manhours required per ton of steel at varying levels of production, use equation (1) following:

$$(1) \frac{\text{Manhours}}{\text{Tons, finished steel}} = 56.7 - 0.367 (\text{million tons finished steel}) - 0.2 (\text{yr}-1904)$$

- To estimate cost of goods sold at varying levels of payroll and raw material costs, use equation (2) following:

$$(2) \frac{\text{Cost of goods sold}}{\text{Tons, finished steel}} = 11.87 + 0.88 \left(\frac{\text{Payroll cost}}{\text{Tons of steel}} \right) + 0.285 (\text{Raw material price index})$$

- To estimate change in dollar sales at varying levels of finished steel production and finished steel prices, use equation (3) following:

$$(3) \text{Total sales in dollars} = 1.857 (\text{Price times millions of tons of finished steel}) - 105.565$$

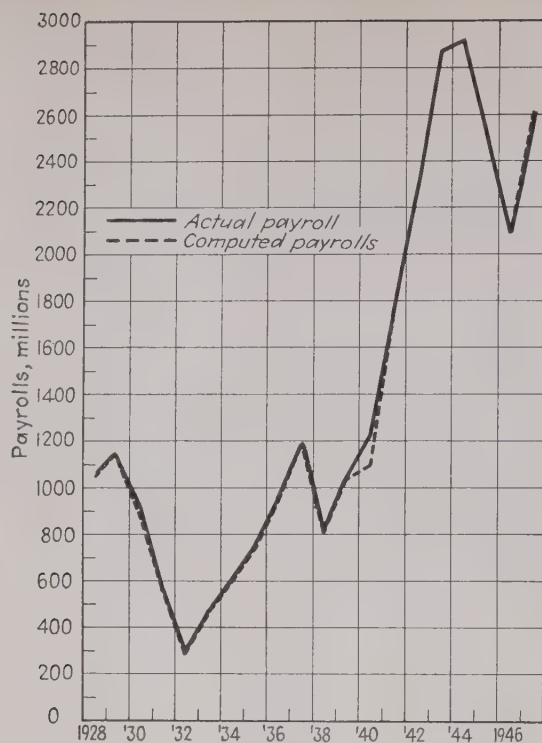


FIG. 1—A comparison of total payrolls as published by the American Iron & Steel Institute and as computed by equation (1) proposed in this article. War years are omitted from the computed series.

more of the steel industry at \$6,691,000,000. Projecting this to 100 pct of the industry indicates a net sales figure which has been estimated for this report at \$7,148,000,000. The average price per pound of THE IRON AGE composite price of finished steel was approximately 3.009¢ per lb for the year. An estimate of 63,500,000 net tons has been used as the measure of shipments of finished steel products by 100 pct of the industry.

For 1947, average hourly earnings of \$1.55, total payrolls \$2,601,888,000, and total cost of goods sold (see definition in the appendix) of \$5,695,000,000 were used. The index of prices of raw materials of the industry stood at 150 (1939 = 100 pct).

In 1947 there was a difference of \$1,453,000,000 between sales of \$7,148,000,000 and cost of goods sold of \$5,695,000,000. This difference between sales and cost of goods sold was equal to 20.3 pct of sales. This is before all other cost items, which when applied, reduced net income for the industry at 6.3 pct on sales, or an estimated \$450,324,000 for 100 pct of the industry.

In August 1948, average hourly earnings of steel workers stood at \$1.74. The raw material price index was 219. If these cost factors are applied to 1947 production of 63,500,000 net tons, the resultant figure for the cost of goods sold is \$7,080,000,000, an increase in costs of \$1,385,000,000 resulting from the rise since 1947 in labor and material costs. This rise would have been sufficient to throw the industry into the red if it had not raised its price and benefitted from an increase in volume.

For the industry to compensate for such an increase in costs without any gain above 1947 output of finished steel, i.e. for the industry to maintain the \$1,453,000,000 difference between its sales and its cost of goods sold, the average price per ton would have to rise to \$73.26 per ton. This compares with the actual price of \$75.05 a ton, measured in both cases by THE IRON AGE composite price.

In other words, if there had been no increase in the price of finished steel, but the rise in costs had occurred, the industry would have gone deeply into the red at the 1947 level of production. The price rise in finished steel which has occurred was almost entirely needed to offset the rise in costs at the 1947 level of production.

However, the price increase was made and an increase in output also occurred. As a result profits of the steel industry in 1948 appear to be running somewhat above 1947 in total, although they are a somewhat lower percentage of sales. It is not the purpose of this analysis to make a forecast, but assuming output at 65,000,000 tons of finished steel for the next 12 months and maintenance of present labor and raw material costs and present steel prices, the difference between sales and cost of goods sold will widen to \$1,834,000,000, as compared with \$1,453,000,000 reported for the calendar year 1947. Of course, the increase that has occurred in overhead items of cost would reduce this gain in profits by a substantial amount.

If the industry, instead of a gain in its shipments, had encountered a decrease of 10,000,000 tons in shipments of finished steel or about 16 pct below the 1947 rate, the situation would be very different. Assuming present prices for finished steel and raw materials and \$1.74 average hourly earnings of steel workers, but 53,500,000 tons of finished steel shipped, sales would be \$7,395,000,000, cost of goods sold \$6,246,000,000 and the margin between sales and cost of sales would have dropped to \$1,149,000,000 or well below the \$1,834,000,000 at the 65,000,000 ton level of finished steel output. In fact, this would probably mean an aggregate loss after deducting all other costs.

These estimates are obtained by substituting the values of the individual assumptions on prices, wages, and volume in a series of mathematical equations determined by the records of two decades described in some detail in the appendix to this article.

It should be pointed out that while the statistical procedure is simple and quick, it also has weaknesses. It deals with average relationships that have been determined by the past. Reliability of correlations must be checked frequently as new figures become available. It must also be realized that if figures are applied to these equations which fall far beyond the limits of those used in establishing the equation, for instance, an assumption of 120,000,000 tons of finished steel, these computations would be reduced to an absurdity. With those limitations in mind, the equations and reasoning behind them should be of interest.

The payroll of the steel industry at any time is determined statistically by two things—average hourly earnings and the total number of man hours worked. Obviously, if one can determine the number of man hours worked and can multiply it by the average hourly earnings, the result should be the total payroll of hourly workers. The total number of man hours varies greatly, depending upon the output of the industry, and steel has been subject to wide swings in the rate of its activity. Because output is so important to all cost relationships in the industry, it was found necessary to work on a “per ton” basis. The words, “per ton” are purposely in quotations for reasons that will become apparent.

Some of the major companies in the steel industry are highly integrated and many produce items other than finished steel. The payroll figure of the American Iron & Steel Institute for 100 pct of the industry covers pay for shipbuilding, for instance, and other activities not directly in production of finished steel. The measure of production used in this analysis is output in net tons of finished steel. The change from year to year in the finished steel figures provided, it was found, a reliable measure of the year-to-year shifts in total activity of the industry. To arrive at what was called a “per ton” basis, figures for the industry were divided by the number of tons of finished steel. The result does not in any sense measure the man hours required to make a ton of steel or the labor cost per ton of steel. The division was simply an operational step to rid the data of a high intercorrelations of output with other variables considered.

Man hours per ton as defined above were found to be dependent very largely on the number of tons produced. For each added ton of output there was a tendency over the years for man hours to drop. From 1923 through 1933 there was a sharp downward trend in man hours not explained by changes in volume. During this period there was considerable gain in productivity of labor, to use an economic term. From 1934 on this trend became less pronounced and almost disappeared. However, this factor of productivity is included in this formula.

Using the period from 1923 through 1947, it was found that year-to-year changes in man hours per ton of finished steel (as defined) can be estimated from the changes in the total of finished steel produced. This relationship is shown in equation (1), table I.

Multiplying through by the tons of steel yields a “total man hours” figure. This, in turn, multiplied by the average hourly earnings figure yields a figure for annual payrolls for the industry. By this means it is possible to estimate the payroll to be expected from any probable level of finished steel production and any given figure for average hourly earnings.

Fig. 1 compares the American Iron & Steel Institute series of total payrolls with the estimate derived from this computation. With the exception of the war years, actual and estimate are reasonably close. During the war the industry was engaged in many activities not normal to it which added to its sales and costs without a commensurate rise in the tonnage of finished

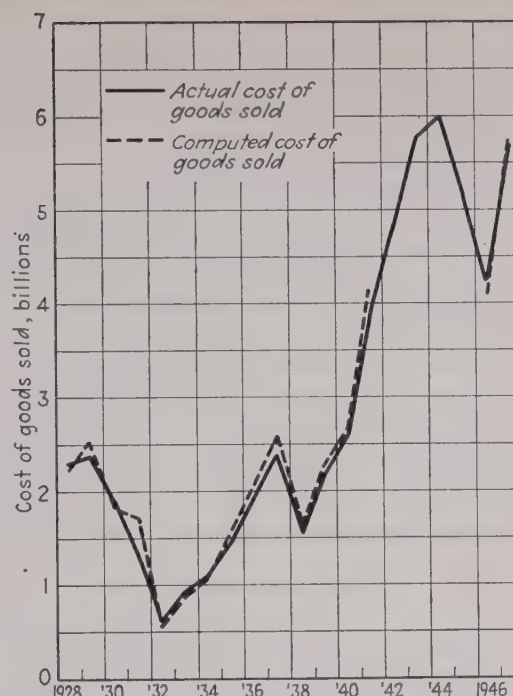


FIG 2.—A comparison of actual and computed cost of goods sold from 1928 through 1947. The computed series was calculated on the basis of equation (2). War years are omitted from the computed series.

steel. The abnormality of the war years is widely recognized. In the statistical analysis described here computations were made both including and excluding the war years and comparisons of the results were made before arriving at the equations shown.

The cost of goods sold for the steel industry presents the same difficulty found with payrolls because of the dependence upon volume of production. Again, it was desirable to remove this factor by dividing total cost of goods sold by the tons of finished steel produced. Because of inclusion of what might be called non-steel producing costs, the warning given with respect to the corresponding man hours per ton figure is applicable. Again, the division was an operational step as an aid to reaching a sound total figure.

There are a good many items that may go into cost of sales, but the principal variables that determine the change in the total are payrolls and material prices. Labor costs appear in both factors. As an approximation of what was paid for materials, use was made of a raw material price index which is described in the appendix. For the period from 1928-1947 the relationship shown in equation (2) in table I was found.

Multiplying by the number of tons of steel gives total cost of goods sold for the industry in such terms that one can estimate what cost of goods sold to anticipate from a given level of activity, a given payroll and a given price of raw materials. With these equations it is possible to give an informed answer to the first two questions.

Fig. 2 compares actual and computed figures from 1928 through 1947 for cost of sales. The two series are close with the exception of the

abnormal years of the war which have already been commented upon.

The final step in analysis is to arrive at a basis for estimating the total sales of the industry in terms of prices for finished steel and the level of finished steel output.

Because the sales figure includes a great deal more than finished steel produced, it is not possible to arrive at a sales figure by multiplying tons by a price measure. However, when the number of tons of finished steel are multiplied by THE IRON AGE composite price for finished steel the changes in the result paralleled the changes in total sales. The relationship is expressed by equation (3), table I.

Fig. 3 traces the comparison of actual sales and computed sales. Again, the two are close with the exception of the war years. By the equation given, it is possible to estimate the change in the dollar sales of any probable shift of price or output.

In summary, then, from statistical relationships which provide quantitative answers to fundamental questions, it appears that substantially all of the increase in finished steel prices has been necessitated by the increase in labor and material costs.

Also, it is evident that if the industry should suffer a decline of as little as 10,000,000 tons of finished steel in its shipments, profit would be approximately eliminated at present cost relationships. The break-even point indicated is at a level of output which is 13,000,000 tons and 32 pct greater than the 1940 output for the industry.

APPENDIX ON SOURCES OF STATISTICS

- 1—*Sales of Iron and Steel Industry, 1921-1947*
Source: "Background Memoranda—Steel Profits" prepared by the American Iron & Steel Institute, undated.

The Institute states that the data for the period 1921-1932 are estimated from available published reports adjusted to represent 100 pct of finished steel production in each year. During the period, 1933-1947 the data are based upon reports to the Institute, adjusted to represent 100 pct of finished steel production in each year. In reviewing the data, the authors found that the estimate of the 1932 figure appeared somewhat high when compared with financial records of the largest corporation in the industry and the Bureau of Internal Revenue figures for a somewhat similar classification. Therefore, an adjustment was made in the 1932 estimate of sales to change the figure from \$896,000,000 to \$675,000,000.

- 2—*Cost of Sales of All Types of Goods Sold, 1928-1947*

Source: 1943-1947, American Iron & Steel Institute—AIS form 11, "Income Statement."
1928-1942, based upon a sample compiled by the authors from "Moody's Industrials."

Figures as reported in AIS form 11 have been adjusted to industry totals in accordance with sample size as indicated on sheet 3 of the form in each year. Data for years 1928-1948 estimated by applying the ratio of cost of goods sold to total sales in a sample of companies each year to the estimated sales of the total industry for the corresponding years. The sample data on sales

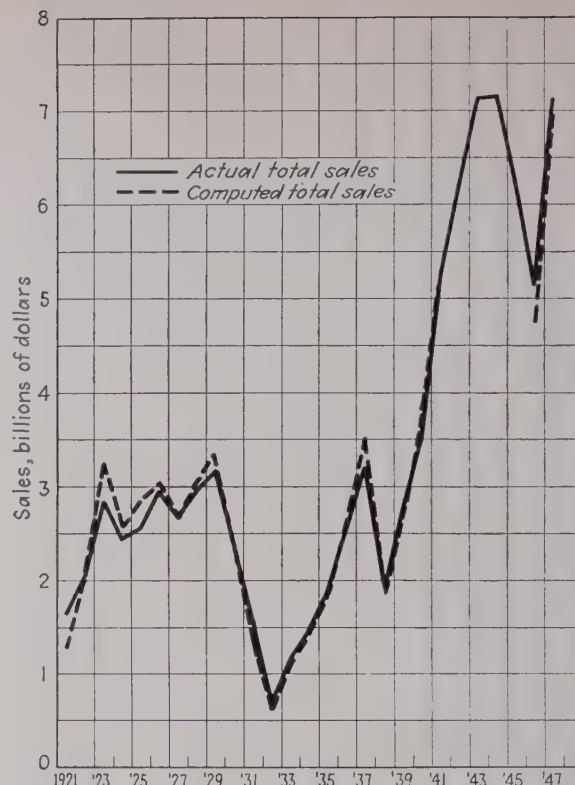


FIG. 3—A comparison of actual sales and computed sales, with the latter evaluated on the basis of equation (3). War years are omitted from the computed series.

and cost of goods sold were collected by the authors from corporation reports published in "Moody's Industrial Manual." During the years 1943-1947 the sample ratios corresponded very closely with the data collected by the AISI. From 1935-1947 the authors' samples include the following companies: U. S. Steel, Bethlehem Steel, Republic Steel, Jones & Laughlin, Armco, Inland Steel, Wheeling Steel, and Colorado Fuel & Iron. Prior to 1935 the sample was reduced somewhat due to the unavailability of the necessary data. Cost of goods sold includes costs other than: (1) administrative, selling and general expenses; (2) pensions; (3) depreciation and depletion; (4) amortization of emergency facilities; (5) loss on sales of fixed assets; (6) provisions for doubtful notes and accounts receivable, additional war costs and contingencies; (7) interest and debt discount and expenses, and (8) miscellaneous charges.

- 3—*Payrolls, 1923-1947*

Source: 1935-1947 data are from a letter written by the American Iron & Steel Institute to the authors dated May 13, 1948.
1923-34 based upon Index of Payrolls for Blast Furnaces, Steel Works and Rolling Mills.
1939 = 100 as published by the Bureau of Labor Statistics.

The BLS index was adjusted to the AISI figures for comparison of overlapping years. These series are not strictly comparable as the Institute figures include all employees whether salary or wage earners and regardless of the product manufactured. The Bureau of Labor Statistics data include only the wage earners in plants of the industry as defined by this Census of Manufacturers. This discrepancy proved to be significant

only during the war years when the steel corporations were engaged in non-steel activities to an important extent.

4—Shipments of Finished Steel, 1921-1947

Source: American Iron and Steel Institute.

Data for period 1934-1947 represents shipments for sales of steel products. For period of 1921-1933 production of hot rolled products has been adjusted to insure comparability with the shipment figure.

5—Raw Material Price Index (1939 = 100) 1928-1947

Source: Prepared by authors.

This index was computed by the authors by combining the following price series:

- a. Iron ore: Mesabi, non-Bessemer, dollars per gross ton as reported in the Annual Statistical Reports of the American Iron & Steel Institute.
- b. Coke: at Conellsville Furnaces, dollars per net ton as reported in the *Metal Statistics*, 1948.
- c. Steel Scrap: Heavy melting, dollars per gross ton, average of Chicago, Pittsburgh,

and Philadelphia prices, *Metal Statistics*, 1948.

The weights which when multiplied by the prices yield an index 1939 = 100 are as follows: 0.602 for iron ore; 0.302 for coke; 0.352 for scrap steel. The base price is equal to \$29.75. These weights were obtained by considering the charge required to make one ton of finished steel.

6—Composite Steel Price

Source: THE IRON AGE, several issues.

7—Average Hourly Earnings

Source: 1947 Annual Report of the U. S. Steel Corp.

This series was used in lieu of the Bureau of Labor Statistics Index or that prepared for the American Iron & Steel Institute because neither of these latter two series were available prior to 1932. Comparisons during recent years indicate that the average hourly earnings of the U. S. Steel Corp. were representative of the industry as a whole.

Chromizing at 1700° to 1850°F

A CHROMIZING process, said to possess features hitherto unattainable with known chromium diffusion methods, has been introduced in this country by the Diffusion Alloys Corp., New York. Developed by a British metallurgist, Robert Samuels, the process is carried out in a manner similar to pack carburizing and can be performed with conventional furnace equipment.

The parts to be treated are packed in conventional pack carburizing containers containing a ferrochromium base material and a suitable catalytic agent, and heated to 1700° to 1850°F, depending upon the carbon content of the part (the temperature varies inversely with carbon content). Chromium penetration depends upon the carbon content also; in low carbon steels the impregnation is about 0.030 to 0.035 in., while in the high carbon steels—say 0.70 to 1.10 pct C—the depth is about 0.003 to 0.005 in.

Experiments are claimed to have been con-

ducted with 52100 bearing steel, where the bearing races have been chromized and heat treated to a core hardness of 63 Rc and a surface hardness of 71 Rc. In the annealed condition, the chromium-rich surface has a hardness of about 49 Rc. In this application, the bearing race components are held at 1850°F, packed in the chromium compound, for some 6 hr. Surface chromium content is held to be from 45 to 50 pct.

Preliminary tests indicate promising corrosion resistance, heat resistance and wear resistance characteristics. An important economic advantage of the method is said to be the ability to employ ordinary carbon steels, which when chromized possess atmospheric corrosion resistance properties usually associated with stainless steels. Gray cast iron is said to be also adaptable to chromizing, resulting in a high surface hardness with a penetration of only 0.0005 in.

Uses Oxygen Enriched Cupola Blast

OXYGEN enrichment of the cupola air blast has been employed at the Harrison-Corry Co., Knoxville, Tenn., for a two-month period in the operation of their two continuous melting cupolas, it is reported in the most recent issue of *Pig Iron Rough Notes*. Most of the Harrison-Corry Co.'s castings are of very thin section and require a fairly hot iron to pour them. The temperature of the iron is required to be 2770° to 2800°F as it leaves the cupola, and this temperature must be maintained throughout the 8-hr pouring period.

The oxygen is not added continuously, but is used intermittently whenever the temperature of the iron has been lowered due to such causes as bridging of tuyeres, low coke bed, or temporary shutdowns.

With the cooperation of the Linde Air Products Co., a temporary oxygen distribution system

was installed and a number of preliminary heats were made to investigate the effects of oxygen enrichment of the blast.

The oxygen is obtained from a 20-cylinder manifold. It passes from the manifold through a regulator into a 1-in. pipe line and then into the 14-in. cupola blast line. The regulator pressure is adjusted so that the oxygen content of the cupola blast is increased from a normal 21 to 25 pct when the oxygen is added. When the cupola melting temperature falls as much as 50°F, the oxygen is added for a period of 1½ to 3½ min and an almost immediate return to normal melting temperature is obtained. The average oxygen addition is for 2 min.

With careful cupola operation and a minimum number of cold iron periods per week, the oxygen enrichment has proved to be a valuable and economical tool in eliminating production downtime in this continuous operation.

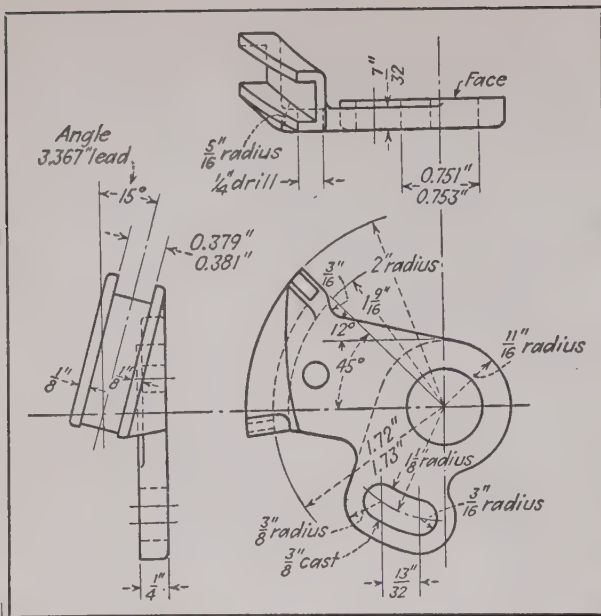


FIG. 1—The various details of the builder cam illustrate the difficulty involved in producing the cam path in the part because of the peculiar shape of the part.

An Unusual Cam

CAMS are of two general types: Flat cams with forms or contour surfaces produced along an edge, and circular cams with the cam outline machine on the periphery of the part. Both types are produced by somewhat similar machining methods, which consist of a master cam, a tracer pin to follow the outline of the contour on the master, and a machining tool to produce the master outline on the workpiece. Two rather different types of machine tools are used to make these cams, the flat cam requiring a profiler or similar tool and the circular cam usually requiring some kind of milling machine.

Cams are used on many types of machines from the roughest to high precision types, and are used for many purposes such as transferring various forms and degrees of motion from one detail of the machine to another element of the equipment. Various kinds of cams are used in textile machines. In fig. 1 is shown a *builder cam*, used on one type of textile machine.

The first operation in machining these details, which are made of cast iron, is to drill and ream the center hole and finish the face. The piece is then placed in a jig and the $\frac{1}{4}$ in. hole drilled.

The next job is to produce the angular cam path and the fixture and method used for this operation are shown in fig. 2.

The fixture shown at right in fig. 2 is made with a cast iron column in which is drilled and bored a 3 in. hole and the bottom face machined in alignment with the bored hole. The cam-path guide body is also made of cast iron with a cored hole in the center. The lower end of this

cored hole is first bored $2 \frac{3}{16}$ in. diam for a depth of 1 in. in which is driven a machine steel plug. The body is then machined all over, the shank to be a good sliding fit in the bored hole in the column. The cam path is then machined in the guide body to coincide with the outline of the cam shown in fig. 1.

On the upper surface of the guide body is fastened with two filister head screws a cast iron plate "A", which has been machined all over. A workpiece locating plug, made of hardened and ground tool steel and machined to a drive fit is placed in the guide body. The locating plug passes through a clearance hole machined into the cast iron plate "A." In the four previously drilled $\frac{1}{2}$ in. holes in the plate "A" are driven tool steel hardened locating pins "B." In a tapped hole in the end of the workpiece locating plug is placed a square headed set screw, under which is an open side workpiece holding washer "C" made of case hardened steel.

The operation of machining these cams is performed on a Becker Brainard vertical milling machine to which has been added the attachment shown at left in fig. 2. A cast iron bracket was designed and machined to fasten to the vertical column of the machine with four filister head screws and two dowel pins. In the arms of the brackets are bored holes in alignment, and in each of these holes is fitted a bronze bearing bushing.

In the spindle of the milling machine is placed a taper arbor machined to a correct fit for the spindle opening. At the lower end of the arbor is fastened with a taper pin a case hardened

Milling Fixture

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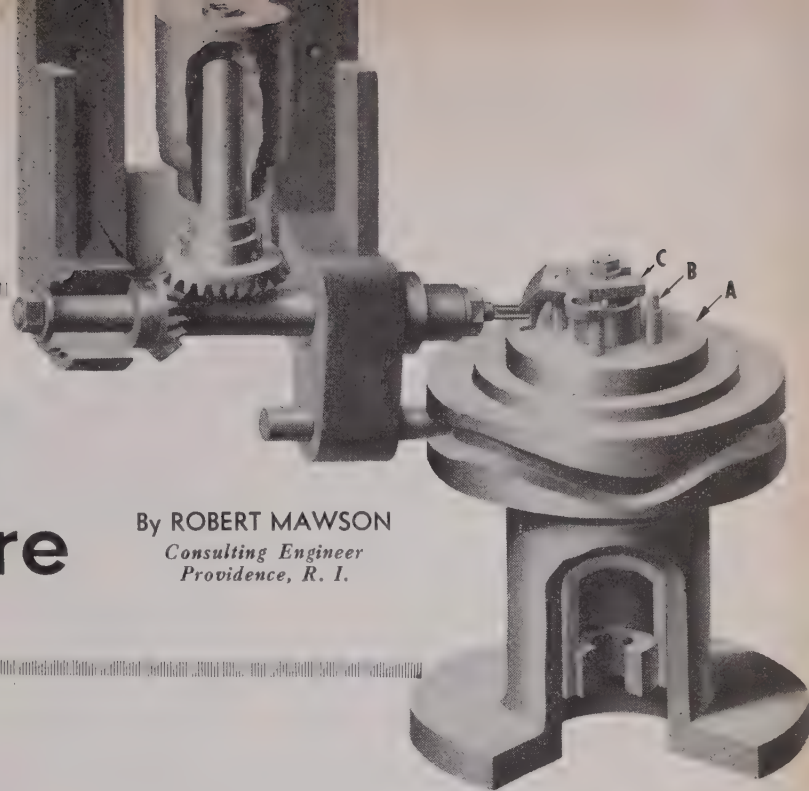


FIG. 2—The fixture for holding the cam during milling is shown at right, and the adaptation of the milling machine itself is shown at left. The spindle of the machine drives the gear train that drives the cutter, and the entire spindle-bracket detail follows the path of the cam guide pin as it traces the path in the fixture.

bevel gear with 24 teeth of 8 pitch. In the bearing bushings in the brackets is placed a steel shaft on which are set two hardened and ground tool steel thrust washers, one on each of the outer surfaces of the bearings in the brackets. When the shaft has been adjusted to its proper operating position, it is set with a hardened and ground tool steel washer and hexagon nut on a threaded portion at the left end.

On this shaft is fastened with a taper pin a case hardened pinion gear with 16 teeth of 8 pitch. This pinion is located and then fastened to be in proper contact with the bevel gear on the arbor. On the right end of the shaft is fastened with a hexagon head sleeve a hardened and ground high speed steel end mill. This milling cutter, 0.380 in. diam, mills the cam surface of the workpiece.

In the extension of the bracket on the right side of the spindle is drilled and reamed a hole at the correct distance from the end mill. In this hole is placed a hardened and ground tool steel guide pin. The pin can be adjusted by a square head set screw on the underside of the holder to obtain the proper depth of contact in the master cam path to suit the cam being milled.

To use the milling fixture, it is first centered and clamped to the machine table usually with a three or four jawed chuck fastened on the face of the table. The table and the guide pin are adjusted until the guide pin enters the master cam path. This brings the end mill into position to cut the cam path to the correct depth. One of the cam blanks is placed over the locating plug and positioned on two of four pins. The

washer is placed over the piece and by tightening the square headed set screw the workpiece is held in position.

The milling machine is then started and, as the guide pin follows the contour of the master cam path in the cam path guide body, the milling cutter mills the same pattern. As the cam to be milled is directed by the travel of the guide pin in the cam path guide body, a similar motion is transferred to the workpiece in the fixture. The milling cutter, being driven by the spindle through the bevel gear and pinion, mills the cam surface in the workpiece as this is revolved on the machine table.

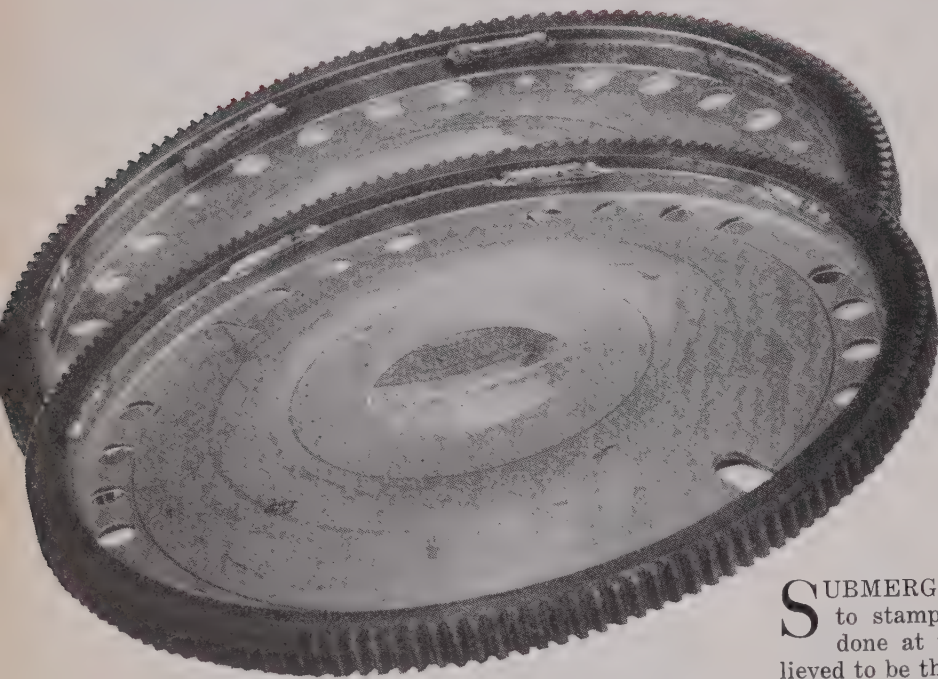
After the path has been machined in the builder cam, the set screw is loosened until the open side washer can be removed and the workpiece can be lifted from the locating pins and plug. Another workpiece can then be placed in the fixture, but using the other two locating pins. The advantage of providing two sets of locating pins with the fixture is to avoid the loss of time required to move the table around after the milling of a piece. The procedure followed with this arrangement is to use one set of locating pins when milling one piece and the other set of locating pins when milling the next workpiece. The milling operation is now repeated on the piece in the fixture in a similar manner as described.

This well designed fixture and method enables the milling of this cam surface accurately and at a low production cost using a standard machine tool with the attachments described for the operation.

Submerged Arc Skip Welding

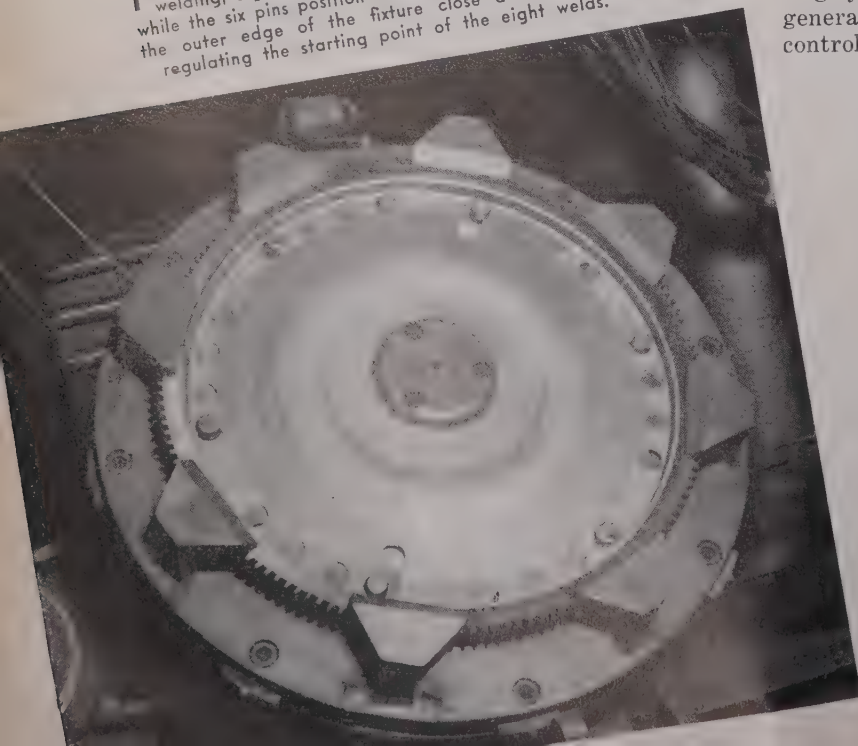
By S. M. SPICE

*Welding Engineer, Buick Motor Div.,
General Motors Corp.
Flint, Mich.*



THE gear and flywheel assembly in the foreground was welded automatically by the submerged arc skipwelding technique, while that in the background was hand welded.

FIG. 1—In the fixture for intermittent submerged arc welding, eight clamps hold a ring gear in position while the six pins position the flywheel. Cams around the outer edge of the fixture close a microswitch, regulating the starting point of the eight welds.



SUBMERGED arc skip welding of ring gears to stamped flywheels is being successfully done at the Flint, Mich., Buick plant. Believed to be the first use of this variation of submerged arc welding, this technique is the result of considerable research and development by Buick welding engineers. This effort included the modification of a standard Lincoln control, as well as the development of an automatic fixture, both of which are key factors in the successful application of the process.

Other equipment employed in the operation is largely standard Lincoln equipment including the generator, the welding head, flux and parts of the controls. The trick was to adapt these components to a fully automatic setup. Results have been excellent and the method is about four times as fast as hand arc welding, partly because the human element is nearly eliminated. The use of the intermittent submerged arc yields the benefits commonly attained when submerged arc equipment is properly applied.

Parts joined in the new skip welding operation are a flywheel and a starter ring gear, constituting components of the Buick Dynaflo transmission. The flywheel is drawn from 5/32-in. low-carbon sheet steel and its circumferential flange makes a close fit inside a ring gear of SAE 1045 carbon steel. This gear is formed from bar stock and butt welded before being turned and the teeth cut and hardened.

Ring Gears to Stamped Flywheels

By the development of special controls and timing devices, automatic submerged arc welding equipment was adopted by Buick to make a series of eight 2-in. long welds that join a ring gear to a stamped steel flywheel. Production has been increased 400 pct, weld rejections have been almost eliminated, and distortion is easily held within rigid limits.

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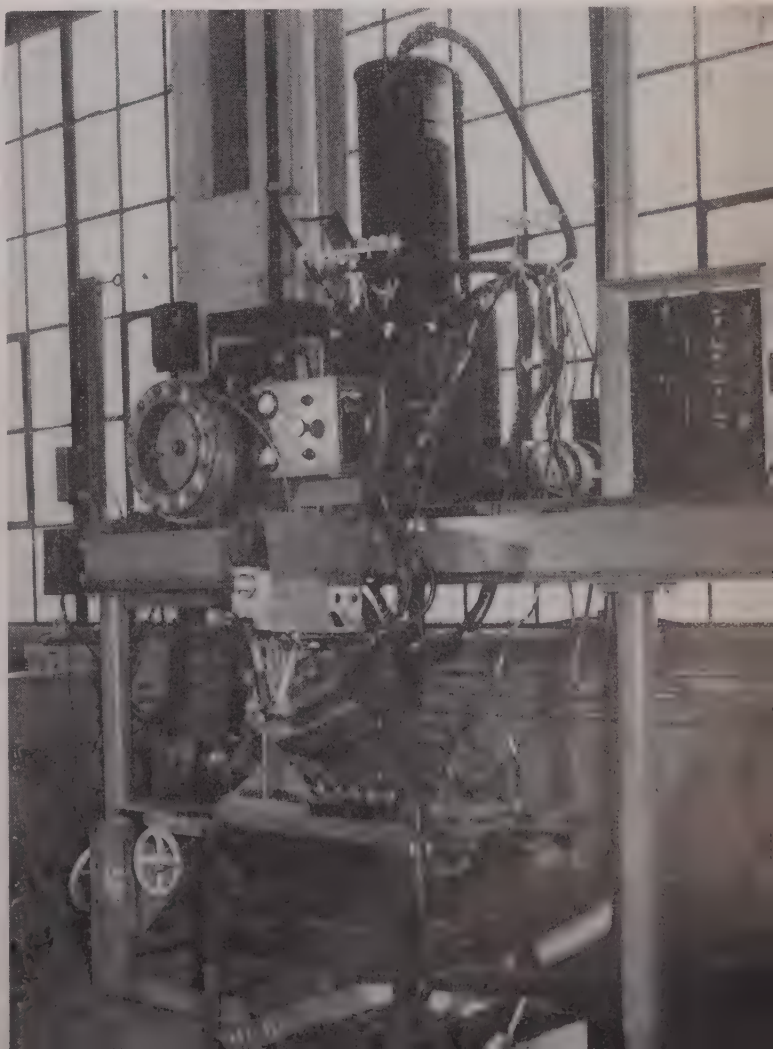
Specifications require that eight welds, each 2 in. long, be equally spaced around the inner circumference of the ring, and that, after welding, distortion of the side face of the ring will not exceed 0.015 in. as measured by a feeler gage inserted between the ring and a flat surface plate. With hand arc welding, distortion often exceeded these limits and resulted in many rejects. Automatic welding holds distortion within the specification limits, and maximum distortion seldom exceeds 0.007 in.

To accomplish this result, it was necessary first to provide a fixture that could clamp the parts firmly and quickly in correct relative position and that could be rotated at a uniform rate while the submerged arc produced the required welds. This fixture, shown in fig. 1, centers the flywheel on a plug and then clamps the ring gear against a flat ring by eight dogs pivoted to the heavy backing plate. This plate has a hub fastened to a piston rod for hydraulic operation.

A base or bracket supports a roller bearing, the inner race of which fits over the hub of the fixture frame. This is arranged to be rotated by the V-groove pulley and a belt from a gear reducer. Fixed to frame is a plate guiding six pins that pass through holes in the flywheel web and have slots into which the flywheel web is locked when turned a few degrees. These pins are pushed outward when loading, but are drawn down by springs back of the plate when the latter is retracted to lock the ring gear. Several of these parts, including the pins holding a flywheel, and dogs clamping the ring gear, can be seen in fig. 1.

On the periphery of the rotating frame are eight cams spaced 45° apart and so set as to op-

FIG. 2—This experimental machine is in use pending delivery of production machines. The latter will have the same basic elements, but the welding head will lift instead of move transversely at the completion of the cycle. A hopper to catch excess flux also will be provided.



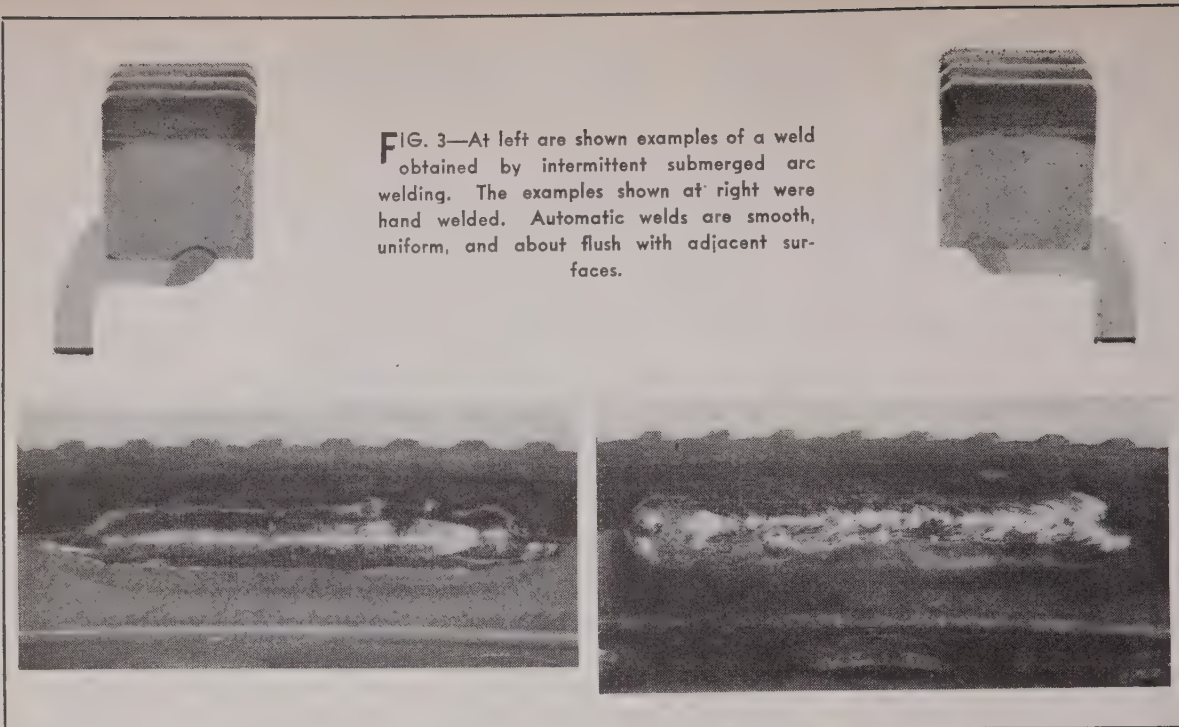


FIG. 3—At left are shown examples of a weld obtained by intermittent submerged arc welding. The examples shown at right were hand welded. Automatic welds are smooth, uniform, and about flush with adjacent surfaces.

erate a switch roller that closes the contacts of a microswitch each eighth of a revolution. At each closing, a welding cycle is started and continues until a weld 2 in. long is completed. This control is the only one operated directly by the fixture itself and synchronizes the welding operations in relation to fixture motion.

Design is such that once a series of eight cycles is started the operations follow one another at regular intervals until all eight welds are completed and the work is ready for removal. There is an emergency button that can stop the machine at any point should functioning go amiss. It is also possible to inch the fixture around and, if desired, make a second pass over an imperfect weld. In normal use this is seldom necessary because functioning is reliable and excellent welds result.

Fig. 2 shows the setup as finally developed in the Buick welding laboratory. It has been employed in production, pending completion of production machines. The latter will employ the same fixture and welding equipment design, but the machines will have a more finished appearance. The welding head will lift vertically at the end of a cycle instead of being rolled along horizontal ways, as in the setup shown.

The fixture will also be located over a hopper so that excess flux that can be reused will fall into the hopper, be screened and returned to the feed tank automatically. On the laboratory built machine, a vacuum hose is set to suck off excess flux but some drops to the floor and is caught in trays.

As can be seen in fig. 2, the fixture is placed at an angle of 45° and in such position that the copper coated mild steel welding wire is fed down from a coil above the surface where welds are to be made and at a point at the front of the fixture. After loading the fixture and shifting the head to bring the electrode into position, a button is pressed to start the cycle. The fixture starts to rotate and the first of eight welds be-

gins as soon as the cam nearest the microswitch closes the latter. Normally, the operator need not touch anything until the series of eight welds is completed.

At the left of the fixture is a constant speed motor that runs at 1750 rpm. It drives through a gear reducer and belt to the fixture pulley, and the reduction is such that it takes about 28 sec for one revolution of the fixture. During this time, eight welds are made. It requires about the same length of time to unload and reload the fixture, hence the total cycle time approximates 1 min, as against 4 min in hand welding. A paint brush is commonly used to brush the fixture clean after unloading. Surface welding speed approximates 97 ipm, but has been as high as 110 ipm in some experimental tests.

Welding beads generally are bright, clean and uniform in quality. They are smooth and approximately flush with adjacent surfaces, even when, if a repair is required, a second pass is made. Welding is so rapid that the temperature rise of the piece as a whole is small, largely accounting for keeping distortion below specified limits.

The potential across the arc during the weld is 26 to 28 volts, dc. Current is 550 to 575 amp and is supplied by a Lincoln welder. The work can be either electrode positive or negative.

Success of this intermittent welding depends upon equipment control, including control of the head and wire and upon precise timing of the welding cycle increments. The work rotates continuously at uniform speed and the electrode point, in effect, describes a circle that follows the joint to be welded.

Since the weld is not continuous, the electrode wire must be moved by a feed mechanism. It contacts the work to strike the arc and then adjusts itself automatically to produce the weld, after which the current is shut off until the next weld is made.

The arc is first struck and welding starts. The

electrode then feeds down automatically until the required weld length is completed, when the wire feed stops. The current, however, continues to flow, burning the wire back until the tip is free of the puddle of molten metal. Then the current is shut off. This is an important part of the control sequence because if the wire were not free of the puddle, it would freeze, cling to the rotating work, and perhaps break the welding head.

Just before another welding sequence is to start, the wire feed is reenergized, causing the wire to feed down and contact the work along which it drags without welding until the mechanically operated microswitch closes. This causes full welding current to be applied and an-

other weld started. Then the cycle is repeated.

This cycle requires the use of three precision timers. Of these, the first controls the welding time; the second, the burn-off time; and the third the delay time while the wire is down but current off.

As the standard Lincoln control is not designed for skip welding, the circuit and some elements had to be modified. With these changes, excellent and consistent operation is obtained and production machines to be installed shortly will be provided with controls of this type. Fig. 3 shows cross sectional samples of the hand welds and welds produced with the submerged arc setup.

Induction Hardening Mill Rolls

SURFACE hardening by induction heating of rolls used in cold rolling sheet and strip is applicable for rolls up to 8 in. diam and 12 in. long, according to a recent report. The methods investigated are similar to those generally employed for induction hardening, the first being total surface heating and the second a scanning or feed method. The scanning method is used for rolls of larger diameters. In the first method, the roll was held horizontally, and for scanning, a vertical arrangement of the roll is preferable. The rolls hardened were of carbon, manganese, silicon, chromium steel composition. The technique was originally described by G. W. Seulen and H. Kuhlbars in *The Iron and Coal Trades Review*.

For total surface hardening, the job revolves at 20 to 30 rpm during heating and quenching. Since a definite minimum energy dissipation is necessary per unit of surface area to obtain the desired surface temperature of roughly 1508° to 1562°F, a relatively high capacity of medium frequency power is required. Depending upon the arrangement of the heating head, the frequency, and the properties of the material, the power requirements range from 1 to 3 kw per sq in. of surface area.

In the feed or scanning hardening method, the head has a heating inductor coil of only one turn or a water cooled coil of a few turns. The quench spray is arranged under the induction coil and the work is quenched immediately upon emerging from the heat zone. The feed rate through the coil is ½ to 3 ipm, depending upon the diameter of the roll. The job revolves at 20 to 30 rpm and the heating capacity required for rolls of equal size is smaller for the feed method than for total surface hardening. The minimum current density per unit of surface, however, is slightly higher than for total surface hardening owing to heat losses that occur with continuous quenching.

Tests made at various frequencies have shown that frequency is not a critical matter although it should be related to the desired depth of hardening. Frequencies covering the range of 600

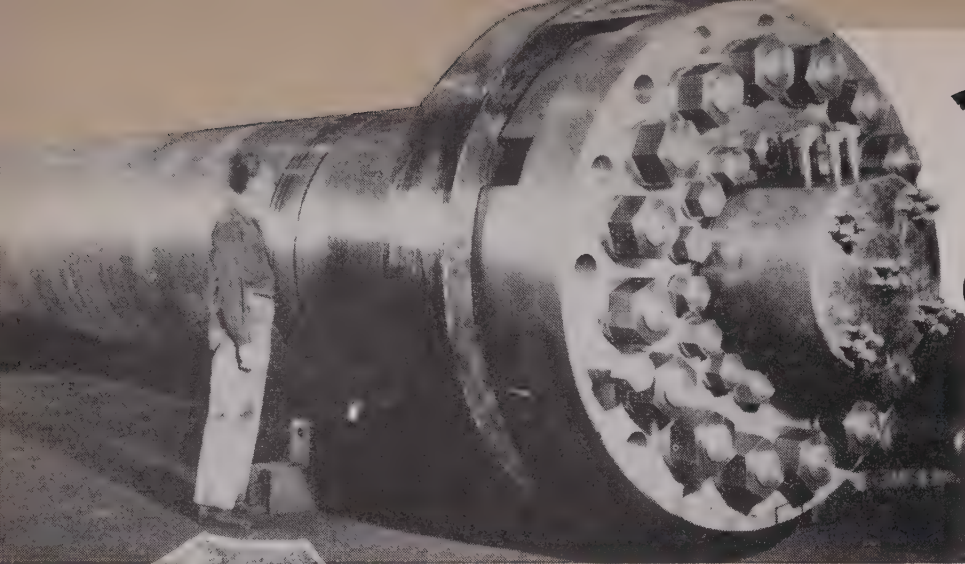
to 3000 cycles per second are sufficient for either method.

For a roll body of 7 in. diam and 8 in. length, and for heat concentration of 1.2 kw per sq in., in total hardening a capacity of about 200 kw is required. Heating time is 11 min for an 0.6 in. depth of hardness, the current being cut for 30 sec after the fifth and ninth minutes in order to insure sufficient heat penetration without overheating the surface of the body. The roll is quenched with tap water at a pressure of 60 to 70 psi. To prevent excessive hardening strains, quenching is stopped when the rolls have reached a temperature of 212° to 248°F. The power consumed totals 1.3 kw-hr per lb of roll bulk hardened.

In feed hardening, the rotary and feed motion can be adjusted independently to any rate. Before hardening, the roll is preheated by moving it once down and then up through the coil, during which period the quench inlet remains closed and the power input and rate of feed are kept constant at 82.5 kw and 2.2 ips, respectively. The surface temperature of the roll after this heating is between 1400 and 1700°F.

This is followed by hardening at a feed rate of 1.3 ipm and a power input of 145 kw. The input density near the heating portion (2.2 in. wide) of the hardening head is 2.1 kw psi. Including, preheating, the total operation takes 27 min.

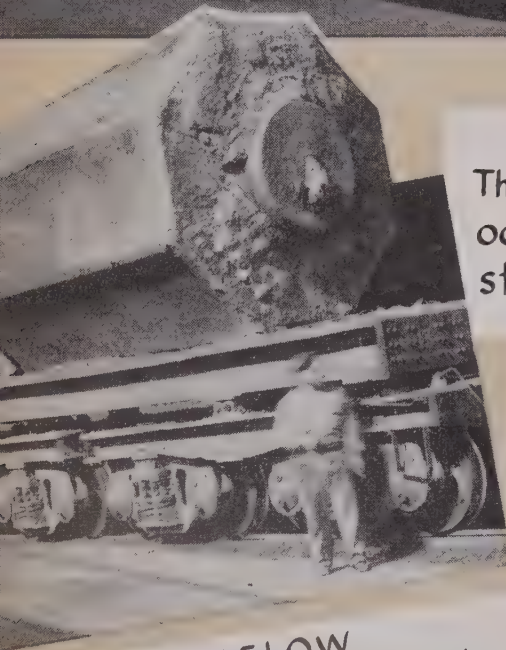
No appreciable decarburization occurs during the short heating time and there is so little distortion that the grinding allowance can be reduced to about 30 pct of the original amount. It is unnecessary to refinish the thread for receiving the cooling pipe. A special advantage is the ability of varying, independently of each other, the depth of hardening in the body and in the journals, and of controlling the hardening at the edges of the body. Only for very highly stressed, heavy-duty rolls is it necessary to subject them, prior to surface hardening, to a heat treatment to attain a core hardness of 300 to 350 Bhn.



Forging alloy steel

LEFT

Completed assembly, weighing some 200,000 lb. The unit will be pressure-tested at 9 000 psi.



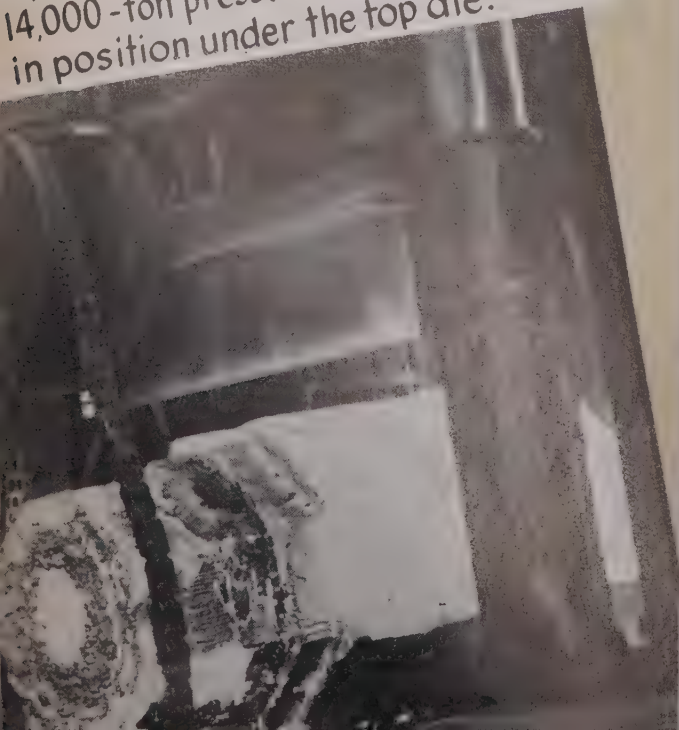
LEFT

The 108-in., 550,000-lb. octagon ingot, after stripping.

BELOW

Start of expanding operation. Narrow die parallel to axis of forging to enlarge diameter without changing length.

BELOW
Top scrap about to be cut from ingot under 14,000-ton press. Slicing blade is shown in position under the top die.



200,000 lb. pressure vessels



Expanded forging emerging from forge furnace

TWO converters, representing the largest one-piece hollow forged alloy steel pressure vessels ever made, were recently completed by the Midvale Co., Philadelphia.

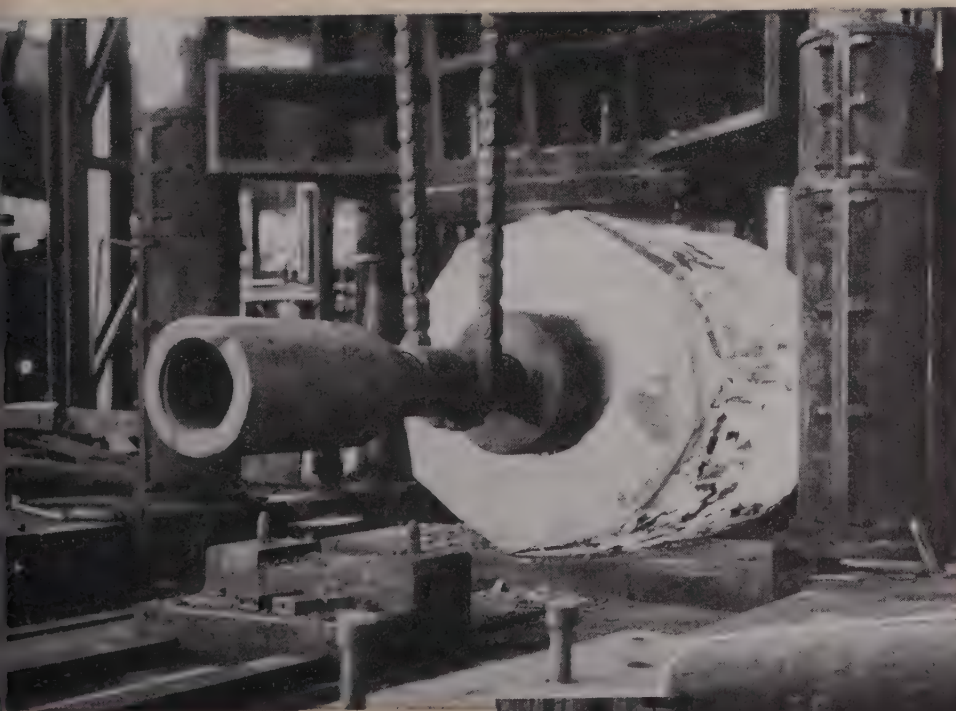
Requiring 550,000-lb ingots, each body was 40 ft long and over 5 ft in diam, and weighed approximately 200,000 lb after machining. Two full open-hearth heats were required to cast such a large ingot. A special chromium-vanadium steel was employed and after heat treating, machining and assembling, the converters were pressure-tested at 9000 psi.

Essentially, the procedure followed in producing the forgings—illustrated in the accompanying photographs—was as follows: Cast the ingot, hot slice top scrap and bottom pool, upset and punch, round-up, increase bore with larger punch, expand on mandrel, draw out length on man-

drel, finishing flange end and bringing bore to final size, and close-in small end. About half of the hot working was accomplished under a 14,000-ton press and the remainder under a 7500-ton press.

While no unexpected manufacturing problems were reported encountered, constant watchfulness was required to shape forgings which would machine to the specified dimensions. Although stubbornly resistant to flow in desired directions, it appears to be the natural perversity of such large pieces to welcome unwanted deformation if the forger slips. Only a combination of proper press equipment and a skill acquired by experience with similar large forgings made ruinous errors unlikely.

The accompanying photographs of the forgings at various stages of completion give an indication of their magnitude and of their flow during forging.



LEFT
First roughing
operation on fully
expanded
forging.

RIGHT
Completed forging. Small
end had previously been
closed-in under the
7500-ton press.



Predicting Carbon Penetration Curves in Carburizing

A method for calculating carbon penetration curves in carburizing, employing solubility and diffusion data, is described by the author. Taking into consideration carbon penetration variables such as time, temperature, steel composition and part contour, this simple mathematical method appears sufficiently accurate to be of practical value.

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THE carburizing process is one of many illustrations of the fact that metallurgy is still largely art rather than science. When the ancient Egyptians added carbon to iron, they undoubtedly determined by trial the most favorable procedure for their purpose. Three thousand years later metallurgists are still using similar empirical methods in determining the depth of carbon penetration.

The purpose of this article is to show that the prediction of results which is the essence of science, is possible in the field of carburizing.

Fig. 1 (broken-line curve) is a carbon penetration curve produced by gas carburizing, given by Harris.¹ As an example of how carburizing data can be predicted using present knowledge concerning carbon solubility and diffusion in austenite, the procedure for duplicating this curve will be illustrated. It is significant that Harris' results were obtained by carburizing a 1-in. round bar of 1020 steel at 1700°F for 8½ hr, ½ hr of which was required to bring the bar to temperature. The bar was water quenched from the carburizing furnace and heated at 1200°F for an hour to make it machinable. Layers machined off the surface were analyzed to obtain the data for plotting the curve.

The prediction of a carbon penetration curve is fundamentally simple since there are only two principal factors that control the carburizing process; (1) surface carbon content, and (2) inward diffusion of the carbon.

If the assumption is made that the rate of solution of carbon at the surface of the bar is very fast, then the surface carbon content is simply the maximum solubility of carbon in austenite at the given temperature for the steel being carburized. The carburizing medium must be capable of maintaining this carbon concentration; thus the first factor can be evaluated using a suitable equilibrium diagram or other source of solubility data. In the present instance the surface carbon content is 1.34 pct in agreement with the results of fig. 1 (broken-line curve).

The second factor, that of inward diffusion of the carbon, offers more difficulty in its adequate determination. In order to obtain a reasonably workable solution of the diffusion equation:

$$\frac{\partial C}{\partial t} = \frac{\partial}{\partial x} \left[D \left(\frac{\partial C}{\partial x} + \frac{\partial C}{\partial y} + \frac{\partial C}{\partial z} \right) \right] \quad (1)$$

it previously had been necessary to assume that diffusion occurs in the x direction only, and that the diffusion constant, D is independent of the carbon concentration C . Both of these assumptions introduced error, with the result that the final calculated curve differed appreciably from the experimental data. Therefore, in the present work, curvature of the bar (leading to two-dimensional diffusion), and dependence of the diffusion constant on concentration, are taken into account.

In theory, there is no reason that curvature of the surface through which diffusion is occurring should not be considered in predicting carbon penetration. The practical difficulty is that the calculation of each point on the penetration curve involves the summation of about 20 terms in an infinite series involving Bessel functions. A method for bypassing such calculations is evidently highly desirable.

Consideration of this matter led to the conclusion that the error introduced by the curvature of the bar is related to the change in area through which diffusion occurs at various depths below the surface. Using results obtained by the laborious Bessel function series, the following equation, based on this change in area, was developed to give a first-order correction for bar curvature:

$$B = \frac{\left(\frac{r-a}{a} \right)}{2.2} \times 100 \quad (2)$$

where B = percent increase in carbon concentration (above the base carbon concentration, 0.2 pct) needed to correct for bar curvature, a = radius of bar, and r = distance of point being considered from the center of the bar. This equation allows the effect of bar curvature to be determined readily.

The work of Wells and Mehl² showed that the value of the diffusion constant for carbon diffusing in austenite at constant temperature varies with the concentration of carbon. Since, in the case being considered there is a range of carbon content at every instant from 0.20 to 1.34 pct, there is a corresponding range of diffusion constant values with the extreme values differing by a factor of two. Evidently the assumption of a constant value of the diffusion constant under these conditions is unwarranted. Fortunately it is possible to preserve relative mathematical simplicity without making this assumption if carbon activities rather than carbon concentrations are employed.

Activity (a) can be considered simply as a corrected concentration value. The activity co-

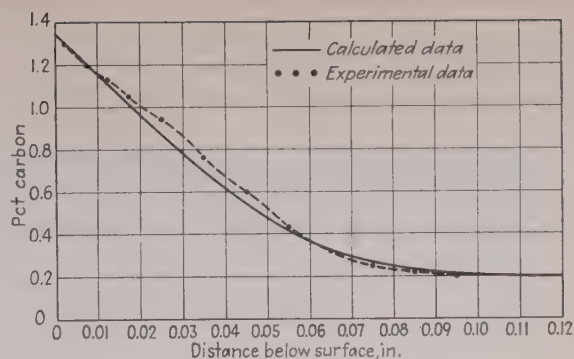


FIG. 1—Comparison of the calculated carbon penetration curve (solid line) with Harris' experimental data (broken line).

o o o

efficient, γ , is multiplied into the concentration, C' , to give the corresponding activity value:

$$a = \gamma \cdot C' \quad (3)$$

Experimental determinations can be made of the value of the activity coefficient, and the activities corresponding to various concentrations can then be plotted. Fig. 2 is the plot of the activities of carbon in austenite at 1700°F determined from the data of Smith.³ If the activities of carbon are known, fig. 2 can be used to determine the corresponding concentration values.

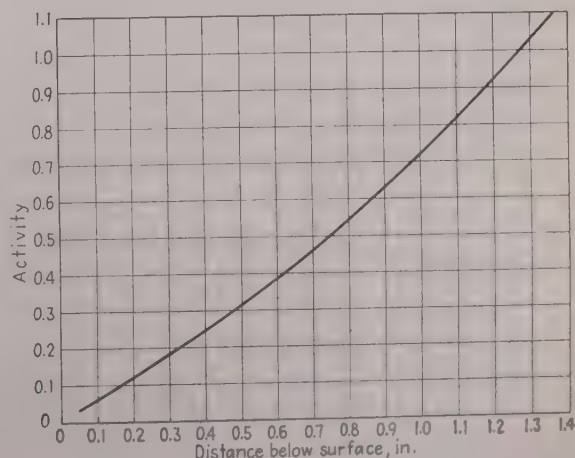
As indicated by Birchenall and Mehl,⁴ if carbon activities are employed, the diffusion constant D_a is independent of the carbon content; therefore, the usual solution of the diffusion equation for diffusion in the X direction can be used without introducing error. In terms of activities this solution can be written;

$$a = a_0 \left[1 - \operatorname{erf} \left(\frac{x}{2\sqrt{D_a t}} \right) \right] \quad (4)$$

where a = activity (above the activity cor-

o o o

FIG. 2—Activity of carbon in austenite at 1700° F for various carbon contents.



responding to the base carbon content, 0.2 pct) corresponding to the carbon concentration at a distance x below the surface; a_0 = activity (above the activity corresponding to the base carbon content) corresponding to the surface carbon content; t = time in seconds during which carburizing has taken place, 28,800 sec. (8 hr); and D_a = diffusion constant for use with activities, 1.5×10^{-7} sq cm per sec at 1700°F. Values of the Gauss error function, $\text{erf}(y)$, are given in various tables such as Peirce's "A Short Table of Integrals."

Plotting the Penetration Curve

From fig. 2 the value of a_0 can be determined as follows:

$$a_0 = a(1.34 \text{ pct } C) - a(0.20 \text{ pct } C) \\ = 1.074 - 0.124 = 0.950 \quad (5)$$

Using this number the values of the activities corresponding to various distances x below the surface of the bar can be calculated by means of equation (4).

The calculations are summarized in table I. From fig. 2, the carbon concentrations C corresponding to these activities can be determined, and these are listed in the table. Finally, by means of equation (2) a correction for bar curvature can be made.

The calculated carbon penetration curve is produced by plotting the corrected carbon concentrations $v.$ the corresponding distances below the surface of the bar. Fig. 1 (solid line curve) shows the penetration curve obtained in this manner (together with Harris' experimental points—broken line). The agreement is seen to be quite good. The explanation of the slight discrepancy in the central portion of the curve is to be found in the $\frac{1}{2}$ hr that was allowed for bringing the bar to temperature. Some carbur-

izing occurs during this time period, with the result that the experimental points lie at a somewhat higher carbon concentration than does the calculated curve. This error could be roughly compensated by using a time of $8\frac{1}{4}$ hr rather than 8 hr in the calculation.

It is possible, therefore, using solubility and diffusion data, to predict carbon penetration curves in carburizing. While this result is of particular significance in the science of metals, its immediate practical value may be considerable. The depth of carbon penetration produced in a given instance depends, among other things, on the time and temperature of carburizing, on the composition of the steel, and on the shape of the part. Previously an empirical test was necessary to determine the combined effect of the variables, but the present method allows a complete penetration curve to be obtained by means of a simple calculation.

Carbon activity values for temperatures other than 1700°F can be interpolated from Smith's data,³ and approximate activity diffusion constants can be obtained from the value for 1700°F using the temperature dependence equation:

$$D_2 = 0.1 e \left[-\frac{32,000}{RT} \right] \quad (6)$$

adapted from that given by Wells and Mehl.²

References

- ¹ F. E. Harris, "The Diffusion Rates for Carbon in Austenite," AIME, T. P. 2217, 1947.
- ² C. Wells and R. F. Mehl, "Rate of Diffusion of Carbon in Austenite in Plain Carbon, in Nickel, and in Manganese Steels," Trans. AIME, 140, (1940), p. 279.
- ³ R. P. Smith, "Equilibrium of Iron-Carbon Alloys with Mixtures of CO-CO₂ and CH₄-H₂," J. Amer. Chem. Soc., 68, (1946), p. 1163.
- ⁴ C. E. Birchenall and R. F. Mehl, "Thermodynamic Activities and Diffusion in Metallic Solid Solutions," AIME, T. P. 2168, 1947.

TABLE I
Data for Plotting the Carbon Penetration Curve

x (in.)	$\frac{x}{2\sqrt{D_a t}}$	$\text{erf}\left(\frac{x}{2\sqrt{D_a t}}\right)$	$1 - \text{erf}\left(\frac{x}{2\sqrt{D_a t}}\right)$	a	$a + 0.124$	C	C (corrected)
0	0	0	1.000	0.950	1.074	1.340	1.340
0.0079	0.1520	0.1702	0.8298	0.788	0.912	1.192	1.199
0.0158	0.3040	0.3327	0.6673	0.633	0.757	1.037	1.048
0.0237	0.4560	0.4810	0.5190	0.493	0.617	0.885	0.900
0.0315	0.6080	0.6101	0.3899	0.370	0.494	0.740	0.756
0.0394	0.7600	0.7175	0.2825	0.268	0.392	0.607	0.622
0.0473	0.9120	0.8029	0.1971	0.187	0.311	0.495	0.508
0.0552	1.064	0.8676	0.1324	0.126	0.250	0.400	0.411
0.0631	1.216	0.9145	0.0855	0.081	0.205	0.332	0.340
0.0710	1.368	0.9470	0.0530	0.050	0.174	0.283	0.289
0.0788	1.520	0.9684	0.0316	0.030	0.154	0.252	0.256
0.0867	1.672	0.9819	0.0181	0.017	0.141	0.229	0.231
0.0946	1.824	0.9901	0.0099	0.009	0.133	0.215	0.216
0.1024	1.976	0.9948	0.0052	0.005	0.129	0.208	0.209
0.1103	2.128	0.9974	0.0026	0.003	0.127	0.205	0.206
0.1182	2.280	0.9987	0.0013	0.001	0.125	0.202	0.202
0.1262	2.432	0.9994	0.0006	0.0005	0.1245	0.201	0.201

Applying Titanium Enamels

Direct to Titanium Steels

EXPERIENCE in applying titanium enamel direct to titanium steel in the plant of a large range manufacturer indicates that such enamel finishes on this type of steel possess important advantages over other porcelain enamel finishes where hardness and acid resistance are required.

At the plant of Westinghouse Electric Corp., tests were started on range platforms in 1946. This component was selected because it required no design changes, was relatively free from welds, and because thin application weights, surface hardness and acid resistance were required. During the experimental work, 100 such platforms, finished with titanium enamel applied directly over titanium steel without a ground coat, were assembled to ranges. These were tested in actual home use, and a check made about 6 months later indicated that no difficulties were being experienced and platforms were holding up better than those conventionally enameled.

The great advantage of the process of applying titanium enamels directly to titanium steel lies in the thin coat of glass required to give the desired coverage. With thin weights of application the industry can put into the field a product that is more resistant to chippage. Also, warpage is overcome and lighter gages of steel

can be utilized by the use of titanium steels. As this process grows the old familiar ground coat will become obsolete, with the possibility that the enameler can double his plant capacity with existing enameling equipment.

Before production could start it was necessary to install a nickel tank and filtering equipment in the continuous pickle setup to provide the necessary nickel flash. Production operations were started early in 1948 and gradually worked in with production of zirconium enameled components. At the present time all platforms are processed with titanium enamels and to date more than 35,000 have been enameled.

In general, titanium steels may be fabricated as readily as regular enameling steels but dies must be kept in top condition to avoid scratches which would show through because of lack of ground coat and thinness of cover coat. Welding must be controlled although spot welds have given no trouble. In gas welding a strip of the parent metal should be used to prevent pop-off when a filler is necessary. The Heli-Arc process has been found satisfactory without use of a filler rod and by using parent metal as a filler.

Enameling procedure in general consists of pickling, inspection, spraying in individual booths, drying, firing, applications of switch

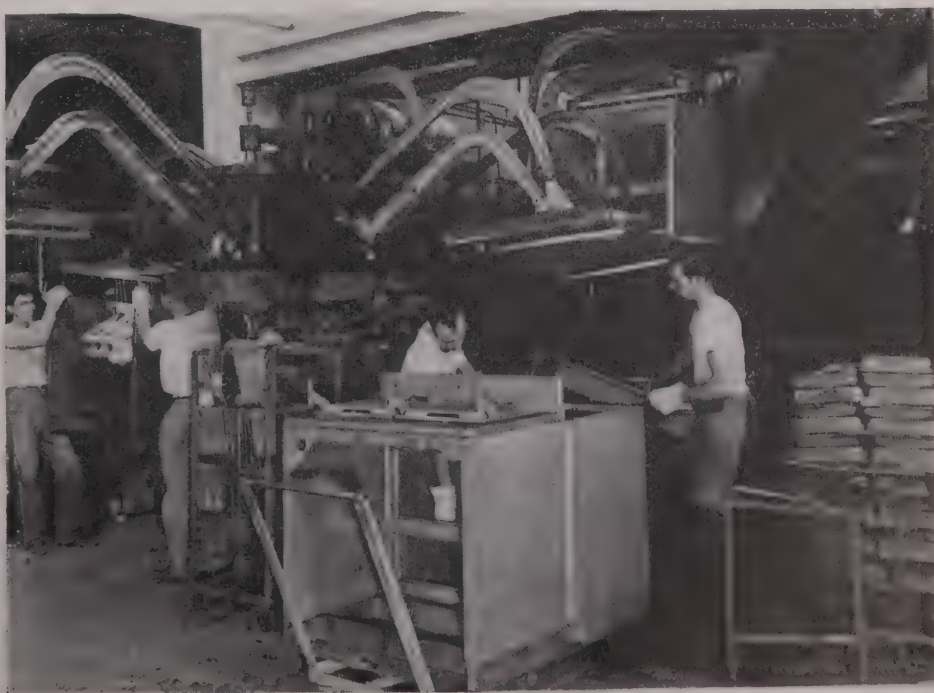


FIG. 1—Loading and unloading stations on the pickle machine.

markings by screen process, and refiring. Loading and unloading stations on the pickling machine are illustrated in fig. 1. As titanium enamels are more sensitive to impurities and subsequent discoloration, a rack was designed to hold the piece in transportation from pickle to the spray booth so that the smallest area possible was subject to rubbing on the rack.

This article is an extended abstract of a paper presented by J. L. Lannon, Westinghouse Electric Corp., at the 10th Annual Forum of the Porcelain Enamel Institute, University of Illinois, Champaign, Ill.

Before spraying, the platform surface is wiped off with a clean dry cloth and digs and scratches are removed. In spraying, a DeVilbiss 765 air cap with E tip and needle on an MBC gun are used to give better atomization and smooth fin-

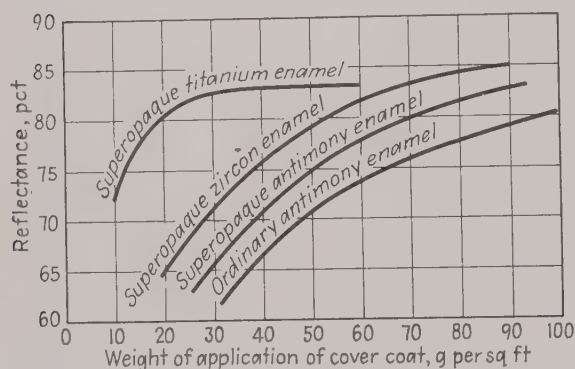


FIG. 2—Reflectance in relation to weight of application of cover coat for titanium enamels as compared with other enamels.

ish. As titanium enamels do not flow as readily in the fire as over ground coat, care must be taken to avoid lumps. A spray weight of 30 g per sq ft on one side is maintained. While lighter application weight is sufficient, it was found that lighter weights do not smooth over in firing under present conditions and leave a rough surface. Drying is accomplished in the conventional manner.

Because bisque pieces must be handled with more care due to low strength, and since enamel discolors more readily from perspiration and dirty gloves, the piece should be handled only on the back side.

Titanium enameled platforms are fired at 1530°F for 4 min. This is rather severe for other ware processed along with the platforms using ground coat covered with zirconium enamels but is not quite enough for the titanium process. At present the rough condition encountered is overcome by application of the screen process and then refiring at the same time and temperature. However, frits that show promise of smoothing-down on one firing have been developed and are now being tested.

Percentage of rejects, high at the beginning, has been reduced. Due to color stability of enamels on refiring, reworking of rejects is some-

what simplified. In general it is not necessary to respray but only to spot-spray or touch up before refiring. Boiling from underfiring and from improper cleaning has been a principle cause of rejects. Titanium steels are supposed to be non-boiling and to date this has held true. Most boil rejects can be repaired by simply refiring. Orange peel or rough finish has been a source of trouble but refiring will generally smooth it out. Steel lines which have been encountered seem to be caused by some impurity in the steel but rejects from this cause have been cut in half in recent months due to improvement in steel.

Pink lines, another type of reject, was traced to excess deposition of neutralizer or drain streaks of neutralizer. This has been eliminated by changing to a weak borax neutralizer and installing an air jet to keep froth, that might form on the neutralizer surface, away from the ware coming from the tank. Pinkish-gray spots resembling small water marks were traced to oil coming through air lines or too much oil on the spray gun, and this has been eliminated.

Warpage and hairlining have not been a problem. Platforms have been made of 0.058-in. steel and tests indicate 0.050-in. stock is satisfactory. Reject platforms that are beyond repair are salvaged by sandblasting and rerunning in ground coat. If repickled, the sandblasted surface seems to pick up too much nickel, and leaves a rough pitted surface if the white enamel is applied directly to the steel. Applying the white directly to the sandblasted piece does not seem to decrease the bond of the enamel, but as yet evidence is not conclusive.

The measurement of adherence of titanium enamels to titanium steel is a very debatable question. So far it has not been practical to compare the adherence of enamel applied directly to steel with the adherence of a ground coat. Apparently, a different type of adherence is encountered and therefore should be measured in a different manner. For this purpose a torsion test has been used which measures the degree of twist a standard test panel may be given before crazing the enamel. A normally-processed white over ground coat piece will stand about 45° twist on this test while titanium on titanium will stand 95°. The comparable enamel thickness in this case is 0.015 in. for the normally-processed piece and 0.005 in. for the titanium piece with steel thickness the same.

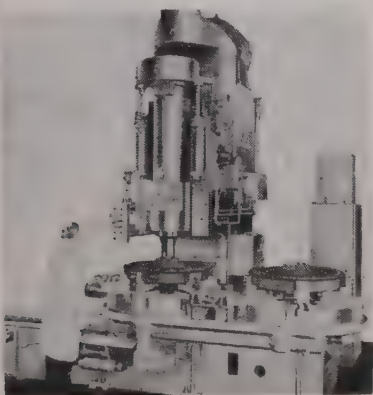
Correlation of data between amount of nickel deposited on the piece in pickling and adherence show that the amount of nickel on the piece is very important to good adherence. Best results are obtained with a nickel deposition of 0.08 to 0.12 g per sq ft of surface.

A comparison of reflectance in relation to weight of application of cover coat for titanium enamels as compared to other enamels is given in fig 2. Scratch resistance of titanium enamels is about 50 pct greater than zirconium. Chipping resistance is also greater, and when chippage is encountered from a hard blow, it is to be noted that the enamel is crushed from the piece rather than flying off a large area.

New Production Ideas . . .

A special machine for boring car wheels, lathes with air gage tracer for contour turning, new flanging, forming, and bending presses, a high voltage motor starter, a radius brake, a sand riddle, and an oil purifier are described this week, together with a gear gaging device, swivel table adjuster, a new Iridite dip, and an isolating paste for hardening operations.

A MACHINE designed to increase production 4 to 1 in rough boring railroad car wheels and similar large forgings and castings is rated at 40 steel wheels or 70 cast iron wheels per hour. Unskilled help can operate the machine which is fully automatic. It has two stations and is equipped with a hydraulically operated shuttle slide that moves the workpiece



from the loading station to work station, then shuttles it beyond, to the unloading and reloading position. Clamping is hydraulic and tool spindle speeds range from 80 to 240 rpm. *Snyder Tool & Engineering Co. For more information, check No. 1 on the attached postcard.*

Selenium Rectifiers

A SERIES of selenium rectifiers for charging 15, 16 or 18-cell lead batteries, 20 to 24-cell Edison batteries of the type used in electric trucks are simple and automatic in operation. Stacks and other component parts are built to withstand heavy duty service. All controls are on the outside panels and other parts are housed in a

ventilated cabinet. Operation is automatic. The battery is connected to the charger and the electric time switch is set. At the conclusion of the charging cycle the battery and the ac power line are disconnected automatically. The battery is disconnected from the rectifier automatically should there be a power failure. When power is restored, circuits are automatically reclosed and charging resumes. The two-rate method is used in charging lead batteries. Edison batteries are charged at an almost constant rate for the entire period. The time switch is set for the desired length of time, usually 1 to 12 hr. *Fansteel Metallurgical Corp. For more information, check No. 2 on the attached postcard.*

Spot Welder Control

NEW electronic controls for spot welders include NEMA type 3B timers and ignitron tube contactors. The timer uses no sequencing relays and will operate at repeat speeds of over 400 welds per min. The simple six tube circuit cancels out operating delays of valve and firing relays. Hold-time settings down to one cycle make it possible to get faster mechanical operation of the welder. The timer can be connected for either common or separate control supply of 115, 220, or 460 v, 50 or 60 cycles. *Square D Co. For more information, check No. 3 on the attached postcard.*

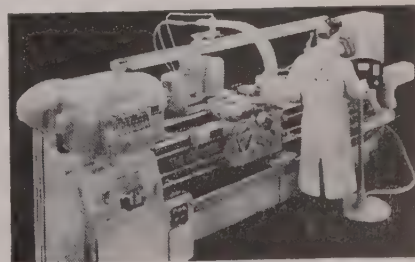
Hard Surfacing Powder

CALLED Surfaceweld A, an improved hard surfacing powder is applied with a carbon electrode, and deposits a thin chromium carbide type of hard surface that is highly resistant to abra-

sive wear and corrosion. One of its characteristics is its ability to be used with an ac arc with a single carbon electrode. Surfaceweld A is for such surfacing applications as thin work, thin deposits, and for use with small ac welders. The powder forms a paste when mixed with water and adheres to flat and curved surfaces. The hardness of the deposit is approximately RC 54 to 61 for one layer and RC 57 to 63 for multiple layers. *Lincoln Electric Co. For more information, check No. 4 on the attached postcard.*

Air-Gage Tracer for Lathes

GREATER productivity at lower cost in multiple-diameter and contour turning is claimed for a new air-gage tracer designed for application to Monarch 16 and 20-in. Series 60 engine lathes, and to 20-in., Model M; 25-in., Model N; and 32-in., Model NN engine lathes. The development provides

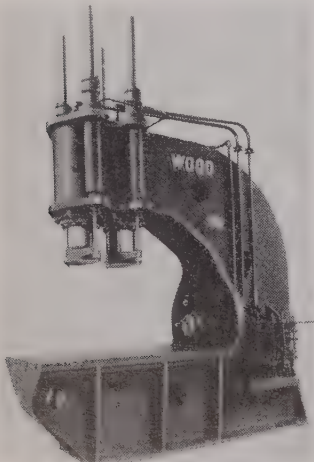


a combination of the features of a modern flexible engine lathe, economies of automatic cycling, and template control of size and contour. The tracer comes packaged with an individual motor drive for the lathe carriage feed. A control system provides stepless variation of the carriage feed rate in a range of 1/2 to 20 ipm. A floor stand carries the control panel that

contains the switches for energizing the control, starting, stopping and reversing the cycle. A large indicator on the panel facilitates the selection of the exact feed desired and provides a visual check on the feed at any time. Adjustable bed-mounted stops are provided to stop the feed and to start and stop the rapid traverse as desired for the part being machined. *Monarch Machine Tool Co. For more information, check No. 5 on the attached postcard.*

Flanging Press

DESIGNED for use in sectional flanging operations, the hydraulic press illustrated is used also for joggling and upsetting work. It is a 200-ton capacity press

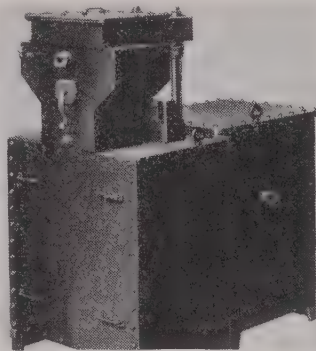


with the two vertical main rams operated in unison. Its capacity with a single vertical ram is 100 tons. The horizontal ram, with a 72-ton capacity, has a detachable cast steel cross-head with a bore and tapered key slot for attachment of tooling. Arranged for accumulator operation and equipped for connection to accumulator line, the press may also be furnished self-contained. *R. D. Wood. For more information, check No. 6 on the attached postcard.*

High Voltage Motor Starter

FOR use in Class 1, Group D hazardous locations, a new combination starter has been developed for squirrel-cage, synchronous and wound-rotor 2300-4600 v motors. Known as the Valimotor Starter, the unit provides unlimited short circuit protection. Regardless of

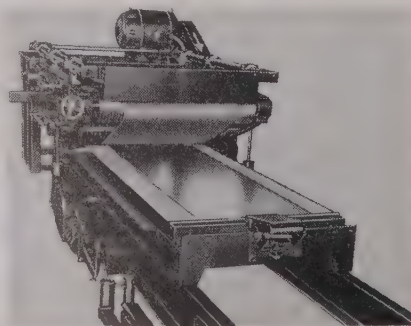
the available kva of the power system, a fault current in the motor circuit is limited to 25,000 kva. The type ZHS magnetic contactor, 50,-



000 kva interrupting capacity, is ample to clear the circuit. An oil disconnect switch permits isolating the starter from the power lines. An overload relay panel gives inverse time element protection for prolonged overloads and trips instantly on short circuits. These Valimotor starters are built for motors up to 600 hp, 60 cycle. For 25 cycle power circuits, the maximum rating is 300 hp at 2300 v and 250 hp at 4600 v. *Electric Controller & Mfg. Co. For more information, check No. 7 on the attached postcard.*

Sheet Grinder-Polisher

A NEW sheet grinding and polishing machine is mechanically operated, with all controlled adjustments operated from the same location. The sheet clamping fixture is positive; the carriage cannot overtravel and damage grinding belts or the rubber con-

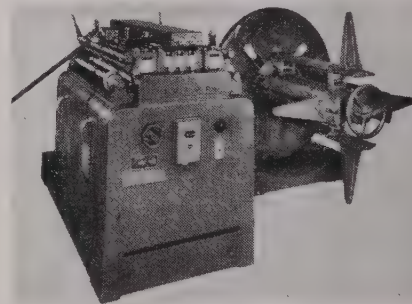


tact roller on which any pressure from 200 to 600 lb is applied by removable hand weights. The carriage travels 58 fpm and is adjustable to any length sheet up to 144 in. It is operated by a reversible motor, stopping automatically

at the end of the stroke, raising the rubber pressure roller so polished sheet can be removed. The motor is direct connected with V belts to the driving pulley on the polishing head. Belts are 16 ft endless. The grinding belt requires a 30 hp motor and the reversible a 2 hp unit. *Excelsior Tool & Machine Co. For more information, check No. 8 on the attached postcard.*

Straightening Machine

ECONOMY of space without sacrifice of quality or speed is featured in a unit that combines in one installation and on one common base a continuous straightening machine and an automatic centering reel. Features of the straightening machine include pinch rolls 4 1/4 in. diam x 38 in. long, one set at each end and a 7-roll straightener with rolls 2 1/4 in. diam x 38 in. long. Upper rolls are

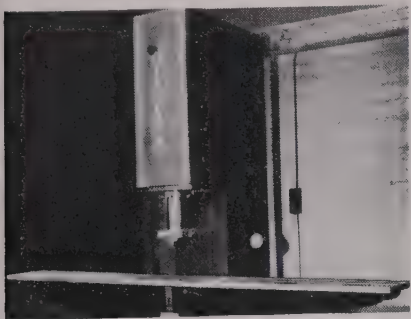


ball bearing and lower rolls are power driven. A 4:1 variable speed, 5 hp drive gives speeds of 225 to 900 ipm. The reel is an automatic centering spindle type, equipped with an electric brake to apply when power is off on the straightening machine. The reel base is mounted in slots for adjustment forward or backward in relation to the straightening machine. *F. J. Littell Machine Co. For more information, check No. 9 on the attached postcard.*

Hydraulic Press

STRAIGHTENING, forming, broaching, forging and assembling operations are possible on a new hydraulic metal working press. Approach speed, the applied pressure of the ram, and the return speed are governed by the movement of one lever. The speed of the ram approach is proportional to the initial movement of the lever and further movement applies pressure

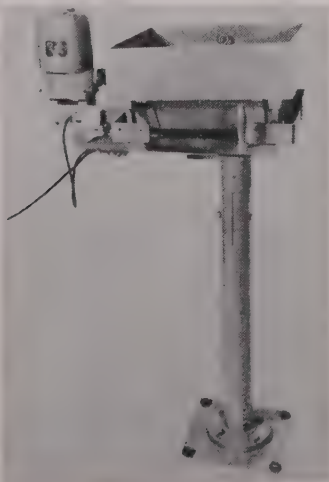
on the work. Releasing of the lever at any point stops the ram, the lever automatically returning to neutral position. The frame, the 30 x 240-in. bed, and table are one piece welded, machined as a single



unit to precision limits. Maximum capacity of 135 lb can be exerted at any point in the 33-in. ram travel. *Niagara Machine & Tool Works. For more information, check No. 10 on the attached postcard.*

Sand Riddle

RIDDLING sand to cover an ordinary pattern in a 12 x 18-in. flask in 2 sec is possible with a new roller riddle. A ¼ hp single-phase motor combined with a limit switch automatically activates the riddle basket, oscillating 900 times per min. The riddle basket has a sand



capacity of 60 lb and rides on rubber blocks. An adjustable column with 31 in. travel makes the machine highly flexible. Double and single channel type machines are available. *Roller Riddle Corp. For more information, check No. 11 on the attached postcard.*

Automatic Transmission

USED to supplement or replace a two-speed motors, providing a broader range of speeds or special ratios, a two-speed automatic transmission has been announced with mechanism consisting of two over-running clutches, one engaging in a clockwise and the other in a counter clockwise direction, so arranged that by reversing the motor, two speeds are provided on the output shaft without changing its direction or rotation. The reversing operation is by means of a push button, limit or timing switch. Two-speed automatic transmissions are built to handle 5, 10, 15, 20, 25, and up to 50 hp motors. *Western Mfg Co. For more information, check No. 12 on the attached postcard.*

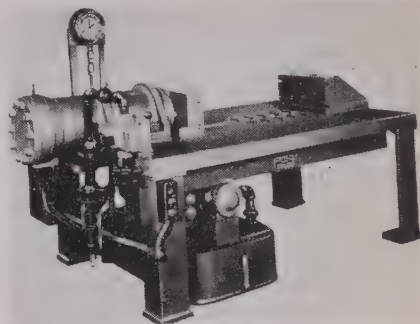
Magnetic Drum Separators

A COMPLETELY self-energized magnetic drum requiring no electric current to produce a magnetic field is powered by Alnico magnets. The unit is adaptable for the automatic removal of tramp iron and fine ferrous contamination where materials are conveyed in spouts, chutes and other conveying systems not employing belts, and is used equally as well for the separation of ferrous from nonferrous metals. The drum separators consist of a revolving cylindrical shell within which the magnet is located, covering about half the cross sectional area of the drum. Material is fed onto the drum shell. Non-magnetic material is discharged first and separately, while the magnetically susceptible portion is held against the shell until it passes out of the magnetic field. The unit is available in 18 sizes including 12, 18, and 24 in. diam and in drum widths up to 50 in. *Eriez Mfg Co. For more information, check No. 13 on the attached postcard.*

Bending Press

A SELF-CONTAINED, 30-ton bending press has been designed for bending and straightening bars, rods, light structural sections, and similar material. It is especially adaptable to the variety of work found in maintenance or machine shops, railroad repair shops, structural shops, and electrical departments. Weighing 6000

lb, this horizontal press is provided with a 3 x 4 ft work table. The size of ram head and resistance head is 9 x 18 in., and increments of 4 in., from a minimum of 12 in. to a maximum of 36 in.,



are used for adjusting distances between these heads. Hydraulic power is supplied by an electric motor-driven rotary vane type pump with a displacement of 17.1 gpm at 1000 psi. The press can be mounted on end and used as a vertical press. It can be furnished in higher capacities and in table sizes to meet various requirements. *R. D. Wood Co. For more information, check No. 14 on the attached postcard.*

Radius Brake

THE Di-Acro radius brake No. 4 with 24-in. capacity in 16 gage sheet steel has been designed for forming duraluminum, chrome-molybdenum steel and other materials of low ductility that would fracture if formed to a sharp no-radius bend. The radii obtainable



are in accordance with the standards recommended by the U. S. Army Air Corp for different thicknesses of these low ductile alloys. Case hardened and spring tempered materials that must be formed after heat treating can be

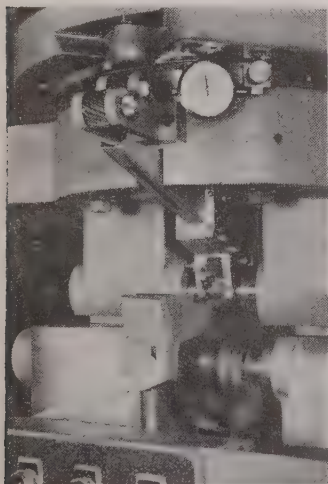
worked to accurate dimensions with the new radius brake. This brake will also form sharp no radius bends such as usually obtained with a standard style brake. *O'Neil-Irwin Mfg. Co. For more information, check No. 15 on the attached postcard.*

Holding Fixture

FOR holding tubing while the wall thickness is being checked, a rotating checking fixture has been designed. It consists of a precision multiple sleeve mandrel operated by an air cylinder. An automatic valve on the air cylinder controls the expansion of the mandrel for quick change of the parts and for firm and accurate gripping during the inspection. *Erickson Tools Div. For more information, check No. 16 on the attached postcard.*

Gear Gaging Device

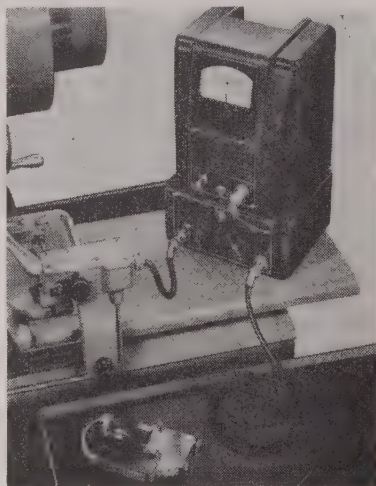
A SEMI-AUTOMATIC gaging device used with automatic loaders on gear shaving machines consists of two gears used to check pinions before finishing. Mounted so they will rotate freely, the center distance between the two gaging gears is such that a pinion with an oversize pitch diameter or one on which the stock is excessive for



best shaving results will not drop through between the gears into the chute. After dropping into the chute, pinions are picked up one at a time by automatic adaptors, automatically shaved and ejected into the exit chute. *Michigan Tool Co. For more information, check No. 17 on the attached postcard.*

Swivel Table Adjuster

ELECTRONIC adjustment of grinding machine swivel tables is now possible with the new Electralign that ignores the condition of the table pivot, table wear, the weight of the workpiece and the location of the headstock and footstock on the table; and indicates



true swivel movements without relation to these variables. The Electralign locates a strain gage measuring head at each end of the sliding table and measures the movements of the ends of the swivel table. By making measurements with strain gages, high sensitivity is obtained and displacements of 0.0001 in. are detected and amplified on indicating scales. Deflections are direct reading. *Brown & Sharpe Mfg Co. For more information, check No. 18 on the attached postcard.*

Work Positioner

A NEW motor-operated work positioner, driven by a hydraulic variable speed transmission and a $\frac{1}{2}$ hp single-phase ac motor, has a load capacity of 100 lb. The table top on this Model I-P rotates 360° at variable speeds, adjustable from 0 to 5 rpm in either direction. It is manually tilted through 135° and locks at any degree of tilt. *Ransome Machinery Co. For more information, check No. 19 on the attached postcard.*

Tube Fitting

A NEW tube fitting developed to meet hydraulic circuit connection standards on production machinery is made in steel with dry-

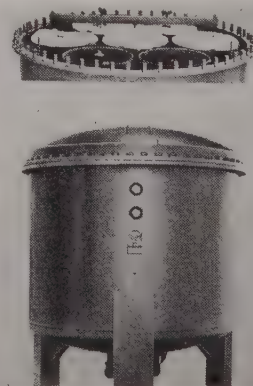
seal pipe threads and with a 37° flare angle. Known as Triple-lok, this fitting is patterned after precision aircraft fittings and passes Army-Navy performance standards including evaluation tests involving pressure, impulse, vibration, repeated assembly and disassembly, over-torquing and other factors that may involve as many as 10,000,000 cycles of test. The fitting accommodates the complete range of tubing wall thickness. *Parker Appliance Co. For more information, check No. 20 on the attached postcard.*

Zinc Electro-Cleaner

A NEW electro-cleaner for zinc base diecastings cleans and tends to condition the surface of the zinc making possible better adhesion between it and the electroplate. This cleaning-condition action of Diversey No. 505 is said to help eliminate blistering, peeling and discoloration on the surface of the final plate. *Diversey Corp. For more information, check No. 21 on the attached postcard.*

Oil Purifier

FOR industries requiring large volume oil purification when floor space is scarce, a multiple refill-type oil purifier, employing seven filtering units, is introduced. Maximum capacity of this unit exceeds 2100 gph of 50 sec viscosity color clear oil on continuous circulation. The seven individual units



inside the steel shell are mounted on center tubes, each unit consisting of a perforated steel basket containing a cloth bag with a capacity of 104 lb of Cranite. The contaminated oil enters the inlet pipe and surrounds the filter baskets, penetrates the cloth bag of the filter unit, and passes

through the Cranite, the felt cover of the center tube, and a metal cloth screen that is an integral part of the center tube. Oil then rises to the top of the center tube and down the stand pipe to the clean oil outlet. *Honan-Crane Corp. For more information, check No. 22 on the attached postcard.*

Lightweight Truck

FOR fast maneuvering and tiering loads that are not excessively heavy, a small, lightweight, electric powered industrial truck has been developed that weighs 4550 lb with the battery, yet manipulates loads up to 2000 lb. Overall length with 30-in. fork is 96 in., and width is 32½ in. The straight-line steering mechanism enables it to turn in 60-in. intersecting aisles and in 109-in. right angle aisles. A low center of gravity contributes to safe-handling. Straight travel speed with full load is 5¼ mph. Maximum height of fork lift is 121½ in. Lifting speed loaded is at a rate of 28 fpm; lowering load rate 45 fpm. Safety valves control lifting and lowering. A dual-cylinder, low-pressure hydraulic system operates the lifting mechanism. *Elwell-Parker Electric Co. For more information, check No. 23 on the attached postcard.*

Marking Machine

BY using a V block as a nest or stamping block assembly in a foot, punch or arbor press, cylindrical and other shaped parts can be stamped with parts numbers or other identification at fast rate. The stamping die may be flat or sharp face, engraved on a flat surface because the lettering or numbering will stamp full unless the cylinder or rod radius is less than double the size of the characters to be marked. *Acromark Co. For more information, check No. 24 on the attached postcard.*

New Iridite

ANEW Iridite Bright dip has been developed for use in automatic zinc plating installations. A variation of standard Iridite Bright, this new formulation makes it possible to obtain a bright chrome coating using as few as three stations after plating. These are: rinse, Iridite, and rinse, followed by the usual drying methods. The coating permanently brightens

zinc, resists stains, and offers food corrosion resistance. The degree of brightness and corrosion resistance can be controlled by the operator. The use of nitric acid with an equal part of Iridite Bright concentrate will replenish the working solution and keep the pH at proper operating levels. *Allied Research Products, Inc. For more information, check No. 25 on the attached postcard.*

Isolating Paste

SELECTIVE hardening is possible with the use of Isopac, a paste that is applied to the sections to be kept soft and left in place while the work is case-hardened. It prevents penetration of carbon gas and insulates the protected section to prevent rapid cooling. The paste will neither crack nor shrink and is easily removed after the work is quenched. It can be applied

with any method of carburization: box furnace, atmosphere, or salt bath. *Denfis Chemical Laboratories, Inc. For more information, check No. 26 on the attached postcard.*

Metal Primer

A COMBINATION chemical pre-treatment and primer for metal, Rust-O-Primer, is said to eliminate the necessity of removing rust or drying the surface before painting. It is a vinyl base, quick drying wet primer applicable over wet or dry, clean or rusted metal, including steel, aluminum or galvanized sheet. It provides a hard, paintable foundation for any type of paints including ship-bottom paints and Acid-Caustichond vinyl type of finish. *Wilbur & Williams Co. For more information, check No. 27 on the attached postcard.*

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Information Free . . .

Heat Resistant Castings

CORROSION and heat resistant stainless castings, largely pots and boxes for carburizing, annealing and nitriding, are described in pamphlet. The casting of jet propulsion engine parts to extremely close tolerances is reported. *Alloy Casting Co. For more information, check No. 28 on the postcard.*

Gas Systems

BOOKLET gives information on gas systems designed to increase the rate of heat transfer by the generation of infrared rays. The radiant heat is said to reduce processing time, give uniformity and high quality of product, and reduce fuel consumption. *Burdett Mfg. Co. For more information, check No. 29 on the postcard.*

Finishing Barrels

FINISHING barrels for deburring, burnishing, cutting down, drying, smoothing and stress relieving are described in booklet. Operation data, giving information on tumbling time and media for various metals, is included. Sawdust separators are also discussed. *Belke Mfg. Co. For more information, check No. 30 on the postcard.*

Machine Tools

CATALOG lists thousands of late type used machine tools covering most of the tools used in the metalworking industry from the smallest type lathe to the heaviest type press and boring mill. *Emerman Machinery Corp. For more information, check No. 31 on the postcard.*

Metallizing Pump Parts

RESTORATION of shafts, hubs, rods, plungers, pistons and other pump parts by metallizing worn areas is described in bulletin. Cost and time estimates are given for a number of particular pump maintenance jobs. *Metallizing Engineering Co., Inc. For more information, check No. 32 on the postcard.*

Steel Strapping

PROTECTION afforded products in transit by steel strapping is discussed in booklet. Case histories of applications in which steel strapping has saved time and money are cited, and difficult jobs, such as the fixing of sharp objects, are described. *Acme Steel Co. For more information, check No. 33 on the postcard.*

Wire Cloth

CATALOG 90 describes industrial screens, wire cloth and wire filter fabrics of stainless steel, chrome steel, chrome-nickel, nickel, nickel-copper, copper, tinned copper, bronze, phosphor bronze, manganese bronze, brass, aluminum and other metals and alloys. *Ludlow-Saylor Wire Co. For more information, check No. 34 on the postcard.*

Blowers

BLOWERS, fans and exhausters for air conditioning, conveying, separating, agitating and other jobs are discussed in booklet. Rotary blowers, roof ventilators, exhaust fans, furnace blowers, spray booth equipment and other units are described. *General Blower Co. For more information, check No. 35 on the postcard.*

Air Control Equipment

PISTON type air control equipment is dealt with in folder. Foot operated combination unit for single stroke action or for holding and releasing is discussed. The unit has an easily operated regulator, 200 lb pressure gage and a fine mesh noncorrosive strainer. *Lehigh Foundries, Inc. For more information, check No. 36 on the postcard.*

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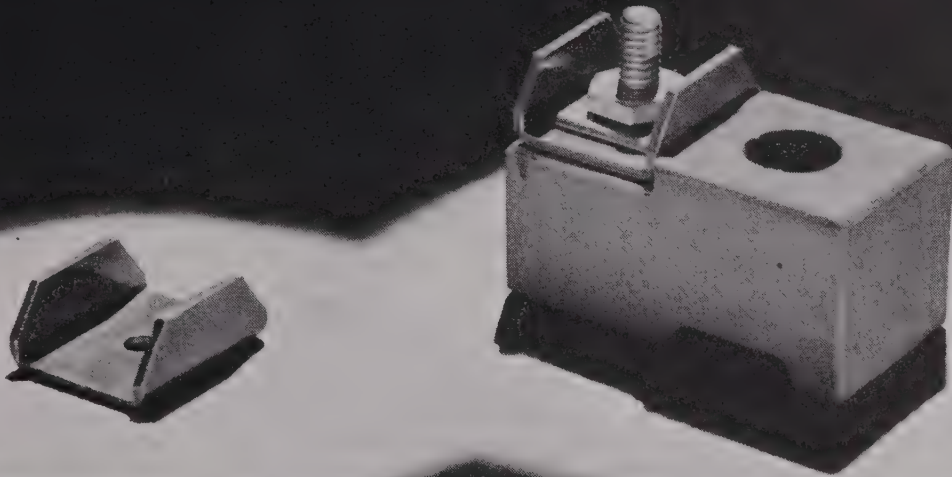
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IT PAYS TO LOOK AT COST PER PART NOT PRICE PER POUND!



*Potential tap, made by Meter Devices Company,
Canton, Ohio, using Revere OFHC Copper*

THERE'S certainly nothing complicated-looking about the small stamped channel section of .042" gauge copper shown in the accompanying illustration. And that's what makes this story all the more interesting.

It is told by Mr. T. J. Newman, Manager of the Meter Devices Company, Canton, Ohio.

"Even a relatively simple application can cause trouble," says Mr. Newman, "a lot of trouble—if you are not using exactly the right metal for the particular job.

"In our case the problem centered around this small stamped channel, originally made of electrolytic copper with a Rockwell B 35/45. The part is bolted to a porcelain base and mounted on the test panel in a standard electric meter box. Used on the service box for test purposes, it allows the connection of a small feed-in wire off the main lines to supply the potential coils in the meter.

"Sounds simple enough. Yet complicated trouble came quickly. It started with cracks in the bends. And that resulted in a high percentage of rejections, along with expensively close inspection.

"It was then that we called in the Revere Technical Advisory Service. Acting on their recommendation, we exactly tested potential taps made of OFHC Copper with Rockwell B 49/50. Results were so satisfactory that we placed a considerable production order.

"In doing so we frankly paid a premium for OFHC.

But that premium is much more than offset by our saving in scrap and the all-around reduction in costs. Our potential taps now have no more cracks in the bends—there are no rejections whatever—and expensive inspection has been eliminated."

Thus the Meter Devices Company has learned, by its own exacting tests, that the premium purchase of OFHC Copper is a real economy. Once again it is proved that the real guide to economy is the cost of the finished part, not the price per pound of the metal of which it is made.

This progressive company is only one of the many modern industrial organizations that have profited by calling in the Revere Technical Advisory Service. Perhaps you would profit too. We suggest that you ask the nearest Revere Sales Office for more information.

REVERE

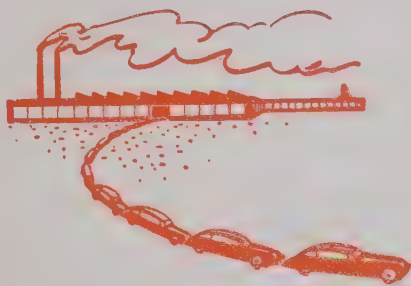
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• G M show at the Waldorf attracts 1/4 million ... Wilson sees 6 million autos produced during '49 ... High compression engines and automatic transmissions feature G M exhibits.



NEW YORK — Laboratory researchers, automobile stylists and engineers are sharing the spotlight with the 1949 cars in General Motors' huge extravaganza, "Transportation Unlimited" now showing at the Waldorf-Astoria. When the show closes Jan. 27 an estimated 1/4 million persons will have seen the new cars here.

Meanwhile, additional GM car showings are scheduled for other major U. S. cities. At the conclusion of the present series of dealer meetings, at least 25 million persons will have been introduced to the new cars.

If GM executives have any reservations in their own minds about a softening market for cars, they are not only not showing it but are forecasting vehicle production in 1949 that is substantially higher than the 1948 figure.

At a meeting here this week, C. E. Wilson, president of General Motors, has forecast production for 1949 of more than 6 million cars and trucks. The basic market for new cars, he argued, is considerably greater than prewar. Employment is up to 25 pct, he said, and he expects, on an average, about

a 25 pct better market than the prewar total.

Mr. Wilson said he expected the necessary steel will be available. Incidentally, Mr. Wilson disclosed that during 1948 GM received 3,160,000 tons of steel or about 3 pct more than it got during its previous peak year, the model year 1940-41. "We would have liked a little more steel," he said, "and we think we will have some more this year."

To get back to the Waldorf show, what intrigues many of the visitors here is the working displays GM craftsmen have devised to tell an engineering story in simple, understandable terms. The working principles behind automatic transmissions, high compression engines, new carburetors and chassis engineering are expertly illustrated. Many of these exhibits the visitor operates himself by pressing a button.

Detroiters who frequent the GM buildings have long become accustomed to seeing the ingenious models GM engineers devise to familiarize the public with their products and the engineering principles that lie behind them. Here at the Waldorf, however, the displays are even more effective than usual. There is already talk that the working models here will be used by GM on television to bring the GM engineering story into thousands of American homes.

Included among the working scientific devices is a GM research 12-to-1 high compression engine surrounded by exhibits illustrating why engineers must tailor their engines to fit available fuels. Effectively adding to the GM argument for higher compression engines and higher octane fuel is a chart showing these tantalizing facts: To the driver who averages 12,000 miles per year, an 8-to-1 compression ratio would mean 1200-3000 extra miles of driving on the same amount of fuel. A 10-to-1 ratio works out to 2400-4200 extra miles.

Use of a 12-to-1 ratio would permit 3600-5400 miles of extra driving.

IN terms of tank cars required to haul the higher octane fuel, 8-to-1 compression ratio would save up to 800,000 tank cars annually. A 12-to-1 ratio would save the hauling effort of 1 to 1.5 million tank cars. For each passenger car driver, a 12-to-1 ratio would save 1 gal of gasoline per day, say the GM engineers.

At the auto news clinic on Wednesday, C. E. Wilson pointed out that GM had expected that, with all the high octane gas developed for aircraft during the war, the availability of high octane gasolines would be somewhat greater than it has been. He admitted there are problems for the oil industry associated with the production and distribution of higher octane gasoline but pointed out that GM is selling high compression engines to the petroleum industry for testing in their laboratories. Fuel developments, he said, would undoubtedly pace the change to high compression engines for the entire industry.

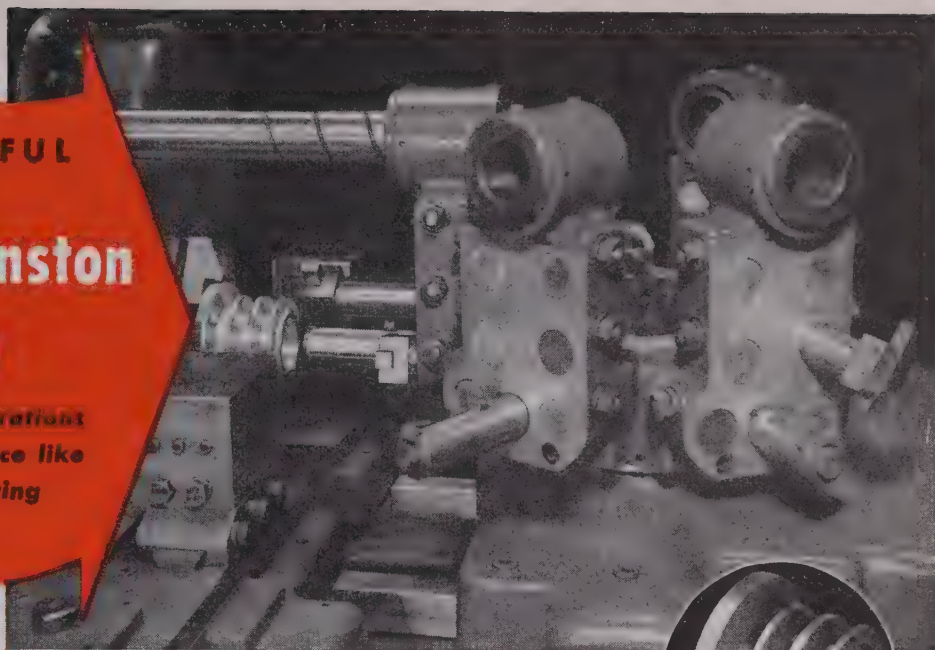
In his talk, Mr. Wilson pointed out that when GM designs and tools up for a new engine, it has hopes of running that engine at least 10 to 20 years with only minor changes or improvements. No major retooling of engine plants will be required when fuels are available to permit the use of 12-to-1 compression ratios, he said.

There are also exhibits showing research in bearings, balancing, fatigue and stress analysis. The bearings exhibit features a large, transparent glass bearing model filled with colored lubricant, demonstrating how increased bearing loads build up oil film pressures between the sliding surfaces of the bearing and the journal. The relative pressures are indicated by the height to which the colored fluid rises in several glass tubes. The glass used to make the bearing required the

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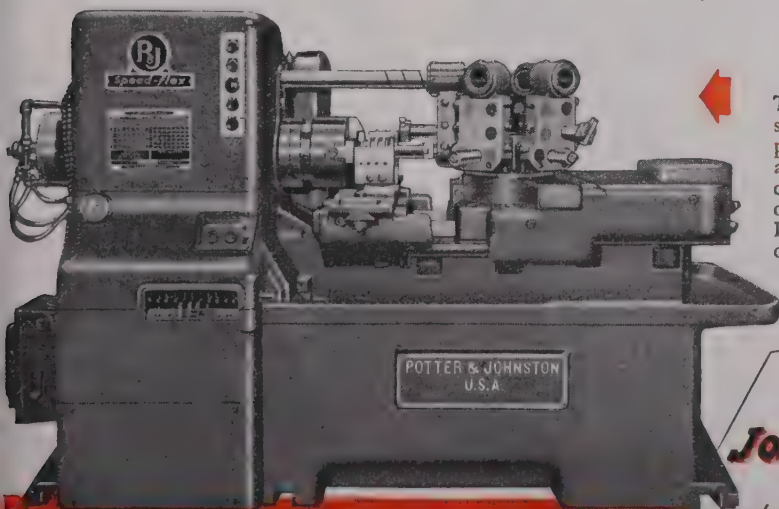
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HERE IS THE JOB, ONE TURRET FACE AFTER ANOTHER

- 1st T.F.: Bore hole halfway; rough turn O.D.; face end; rough and finish form "V" grooves; face flange.
- 2nd T.F.: Bore balance of hole; bore C'bore at front end; finish turn O.D.; face end.
- 3rd T.F.: Finish bore hole and C'bore.
- 4th T.F.: Machine grooves in bore (slide tool)
- 5th T.F.: Size bore hole 2.047" dia.

HERE IS THE MACHINE THE P&J 3U SPEED-FLEX

This Potter & Johnston Automatic Turret Lathe is specially designed for high speed production of small parts. It is equipped with four automatic speed changes and three automatic feed changes; electro-pneumatically controlled. It effects split second change of speeds or feeds or shift from the feed to the rapid traverse. It provides independent or simultaneous cross-slide operation with selected turret faces or with all six.



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3U SPEED-FLEX

use of the thickest piece of laminated glass yet produced by one of the country's leading glass makers, it was disclosed.

Balancing machines of the drill type used to correct unbalance in a part are also on display. These machines are used to balance rotating parts ranging from 12,000 lb Diesel locomotive armatures to the tiny balance wheels for the clock on your dashboard.

A RESONANT type of machine for fatigue testing a crankshaft is also on display. The machine operates on the same principle as the familiar tuning fork. The vibrating members of the machine correspond to the tines of the fork. A rotating eccentric weight on the ends of one of the tines keeps the testing device in continuous oscillation, subjecting the specimen to fatigue loading that simulates actual operating conditions. (This is only one example of the present trend in the auto industry of testing actual parts in fatigue rather than sample test specimens of metal. GM has evolved similar fatigue tests for connecting rods, shafts and even entire motors.)

Many photographs of experimen-

tal work at Fisher Body heretofore held as confidential are on display. Tests used to determine structural strength, fastness of color, fabric wear, effect of weather, noise and other factors that must be determined in building automobile bodies are displayed.

A "cut-away" body demonstrates the new type spring construction used for the front seats of the 1949 Fisher bodies. In the new seats, the coil type spring has been eliminated in favor of flat no-sag springs. Using this construction, space under the front seat previously filled with coil springs is now open and available as foot room for passengers in the rear seat. Incidentally, some weight is also saved by the use of the new design.

Another feature of the new Fisher front seat is the utilization of a curved rail slide mechanism that raises the seat and also changes the angle of the back rest as the seat is pushed forward. Thus, the seat is fully adjustable according to the physical requirements of the driver.

A factor about GM's position in the industry which has been carefully noted by those attending the show is that the two outstanding

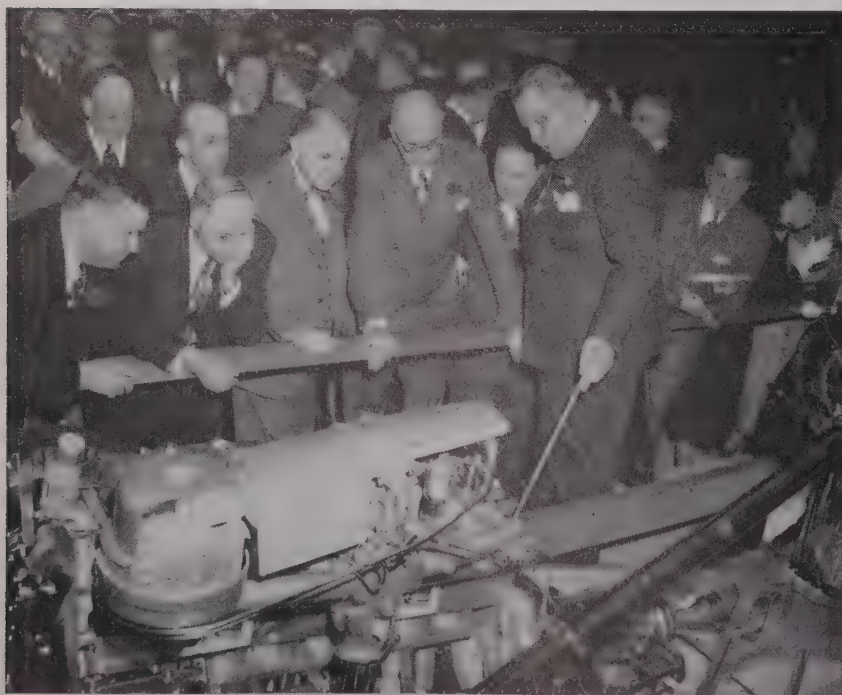
engineering developments in the auto industry since the war are held exclusively at present by GM. These developments are the high compression engine and the automatic transmission. High compression engines are used at present by Cadillac and Oldsmobile. At the New York clinic it was emphasized that the individual GM divisions will make their own decisions about high compression engines; the corporation has no immediate plans to extend the new engines to Buick, Pontiac, and Chevrolet. For one thing, the present fuel situation would make such a move difficult. (It is also understood that there has been opposition on the part of some GM divisions to a change from their present power plants.)

A POINT emphasized in the discussions was that automobile engines should always be discussed in terms of the entire car—including its weight, transmission, type of driving mechanism, etc. In each case it is the integrated unit rather than a particular part of the unit (such as the transmission or the engine) that has to be considered, according to GM engineers.

GM plans to continue for the present both its Hydra-Matic and Dynaflo transmissions. Both are regarded as doing an excellent job for the divisions using them. Since the two devices are not far apart in actual performance, GM officials have predicted that both may continue to be used for some years to come, with the superior device eventually crowding out the inferior one.

For the present, GM has no plans, it was stated, for altering the situation in which several GM divisions appear to be competing with one another in the transmission field. As a matter of fact, such competition between divisions ought to be encouraged rather than discouraged, according to GM top executives.

YOU NEVER KNOW: Quite by accident, of course, this picture taken at the General Motors auto show in New York caught several prominent Ford officials looking intently at one of the GM exhibits. Prominent in the first row are Harold Joy of the Ford Purchasing Dept. and Del Harder, vice-president in charge of operations. Several rows back is Ernest R. Breech, executive vice-president of Ford.



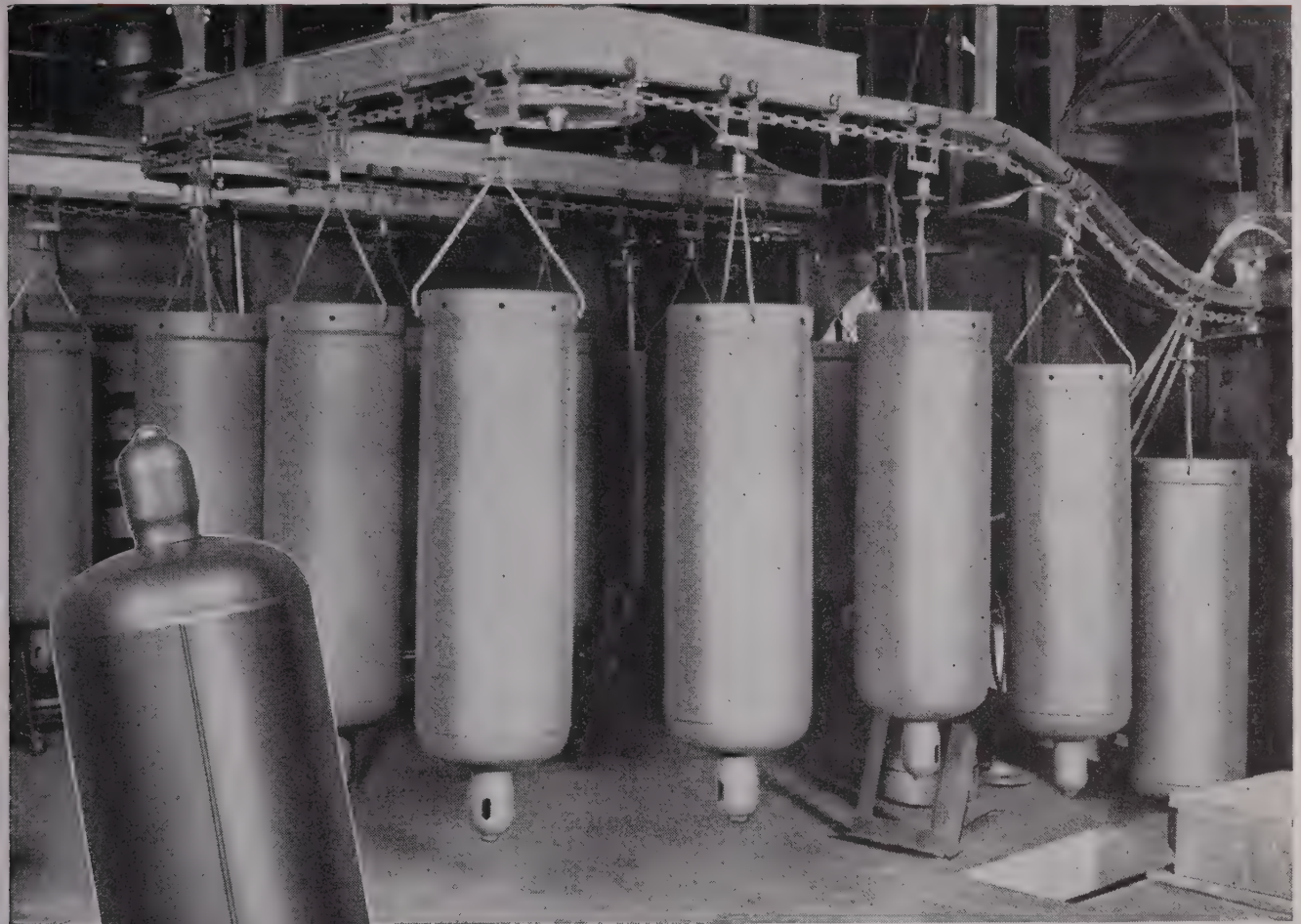
New Mill on Auction Block

Pittsburgh

• • • The Office of Alien Property has put more than 1800 tons of steel mill machinery, originally made by the Mesta Machine Co for Japan, on the auction block. It is estimated that the equipment originally cost over \$1 million.

N-A-X HIGH-TENSILE STEEL in L.P.G. Cylinders

means light weight with added safety and durability



Photographs of the Lee cylinder, courtesy of the Steel Cooperaage Company, Detroit.

Because of the greater strength and excellent fabricating, welding and copper brazing properties of this low-alloy, abrasion- and corrosion-resisting steel, cylinders made with it (to conform to I.C.C. safety requirements) are 35% lighter in weight than when made with conventional carbon steel.

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• New social security proposals could raise steel pay roll taxes to \$60 million . . . expanded benefits not to lessen union demands for employer-financed systems.



WASHINGTON — More will be heard over the next several months about pensions, medical aid and related subjects than during any other corresponding period since the present federal social security program was being set up under the New Deal administration.

The present situation might well be likened to the case of the several men who mounted a horse and rode off in different directions. Everyone wants to climb on the social security horse, but there are varied ideas as to which direction the horse should travel.

Nearly everyone wants expansion of present coverage and increased benefits. Some favor the government-sponsored joint contribution method. Still others think that either the government or industry should pay the entire cost. The unions, as a whole, are in favor of both plans—to run concurrently—in order to get the greatest benefits possible for their members. For obvious reasons,

the workers themselves are not hot for any plan that calls for taking additional bites from their pay envelopes.

Under administration proposals for new social security legislation, payroll taxes of the iron and steel industry could conceivably be hiked within 3 years to an annual rate of \$60 million or more. Half would come from the company coffers and the other half would be deducted from workers' pay.

This figure is based upon the assumption by some government economists and some congressmen that steel demand will continue at or above present levels.

PRESIDENT TRUMAN has asked that the present ante of 1 pct each on worker and employer be upped by a half of 1 pct beginning July 1. This would allow additional coverage and possible increase of old age payments. It would also add an additional levy of \$2 billion on the national payroll, half of which would come from the workers' take-home pay.

In addition, legislation is sought which would allow the government to start upon its much-talked-of public health insurance program. This plan is scheduled to operate along somewhat the same lines as the present social security system. The employee and the employer would each foot half the bill. It would start in a modest way, perhaps beginning with dental care and services of visiting nurses.

Actual cost would depend upon the type of legislation finally enacted by Congress. The Federal Security Administration suggests that, for a starter, a tax of one-half of 1 pct split between employee and employer on the first \$4800 would be sufficient. But, as the program gets under way, FSA estimates that it would be necessary to jack up the payroll levy to 3 pct within 3 to 5 years.

Assuming that employment remains near the present levels,

medical and social security deductions would then amount to \$6 billion on the nation's payrolls as a whole, and a possible \$60 million on the iron and steel industry alone.

The question then arises as to what effect all this will have on labor's position when it meets with management at the bargaining table. Indications are that labor generally may be willing to modify new wage demands in favor of pension plans, medical care, and other social benefits.

LAST spring, for instance, the United Steel Workers' proposals to the U. S. Steel Corp. included life insurance during employment and a paid-up policy on retirement, sick benefits, and assistance with surgical costs. Since the union was bound by a no strike agreement, it was prevented from using its most potent weapon for exacting its demands.

"Discussions on this subject have been continued," union spokesmen say. "The USW expects to pursue its social security demands next spring when negotiations on both wages and social security may be opened."

Both the CIO and the AFL have generally supported the government's moves toward social security and all that it implies, but both maintain that the present program falls far short of needs. They point out that under the present law an aged person could receive as little as \$10 a month (the average is closer \$25) and that a worker who has been averaging \$400 a month would receive only about \$45 a month if he retired now.

In demanding that Congress keep its campaign promises and enact broader social security legislation, labor advances an argument that Congress would find hard to knock down—even if it felt inclined to renege.

"Congress has provided its own precedents," CIO spokesmen say.



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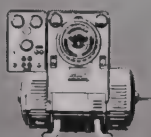
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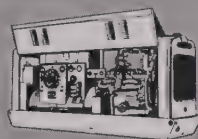
Portable Welder



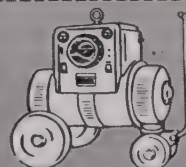
Generator-Welder & Power



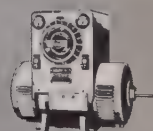
Transformer Type A.C.



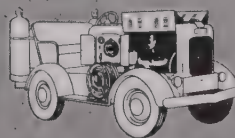
Combination Welder & Power



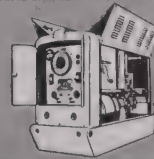
Electric Motor Driven Welders



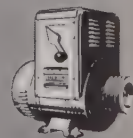
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AC-AC Welder, Pwr.—Pulley

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| ☐ "Build Your Own" Welder & Power | ☐ Electrodes |
| ☐ AC Shop Welder | ☐ New Welder Catalog |

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"Under its Railroad Retirement Act, average benefit payments are now running at about \$85 a month and payments of \$144 a month are possible. Besides, congressmen have protected themselves very well. It is possible for a congressman to retire at 62 with a pension of up to three-quarters of his last year's pay."

THE AFL has already offered to the Administration its own recommendations for revising the social security law. In effect, the AFL generally endorses the proposals set forth by FSA. However, the AFL would have payroll deductions stop at a maximum of 4 pct. It wants benefit payments increased to a maximum of \$145 a month for married men. No mention is made of private pension and medical plans.

On the other hand, the CIO frankly regards government plans as a supplement to anything it may win from management or industry. In the case of the Steelworkers, as well as the Auto Workers, the unions have usually demanded that the employers carry the whole cost of such programs.

The reason for this approach, officials say, is that employees cannot be compelled to take part in a privately set-up security plan. As a result, a majority of workers are uncovered because they are unwilling to bear all or part of the cost. In the instance of such a plan at Inland Steel, only about a fourth of total employees are participating.

NEW demands upon industry for such plans will be made at the earliest opportunity, regardless of congressional action on the government plan. Such proposals are likely to be modeled along the lines of the program established by UAW at Kaiser-Frazer. This is regarded by the CIO as its biggest success.

Roughly, it provides for a trust fund administered by a board consisting of equal numbers of labor and management representatives as members. The fund is financed entirely by K-F.

Some believe that present government proposals to broaden social security coverage and payments, plus plans to include medical care under the program,

will strengthen the hand of management in opposing labor proposals for company - financed plans.

Still others, however, believe that it will have little effect, pointing out that the present federal system has not lessened the drive for private programs, and that government programs are intended only to supplement other systems.

Mine Bureau Reports On Copper and Tin Deposits

Washington

••• Results of two wartime investigations of copper and tin deposits in Nevada, Virginia, and North Carolina are described in separate reports which have been released by the Bureau of Mines.

The two publications are:

Report of Investigations 4378, "Investigations of Majuba Hill Copper - Tin Mine, Pershing County, Nev.," by E. J. Matson, bureau mining engineer, Reno, Nev. From February to July 1943 the bureau investigated this mine in search of extensions to known deposits, and studied the grade of copper and tin ore. Information on sampling, long-hole drilling, underground excavation, and ore-preparation tests are given in the report. This mine produced about 4000 tons of 12 pct copper ore from 1916 to 1919, and 23,000 tons of about 4 pct copper ore and 350 tons of 2 to 4 pct tin ore from 1941 to 1943.

Report of Investigations 4384, "Investigation of the Virgilina Copper District, Virginia and North Carolina," by Almon F. Robertson, bureau mining engineer, and A. W. Newberry, Alford Roos, L. A. Dahners, and C. J. Cohen, former bureau mining engineers. Through drilling, trenching, and underground sampling, the bureau investigated the Seaboard, High Hill, Durgy, and Blue Wing mines in the Virginia copper district of North Carolina and Virginia.

Work on these projects was conducted by the Mining Div. of the bureau with assistance from the Federal Geological Survey and state agencies. Copies may be obtained free from the Bureau of Mines, 4800 Forbes St., Pittsburgh 13.

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• Government in steel called "mistake" . . . Business outlook conference yields diverse opinions . . . Utah ores face new tax . . . Northwest power gets tighter.



LOS ANGELES—If the government goes into the steel business, it will be one of the most serious mistakes it has ever made, asserted Carleton B. Tibbetts, president and manager of the Los Angeles Steel Casting Co., president of the Metal Trades Mfg. Assn., and vice-president of the Merchants and Manufacturers Assn., before 500 business and industrial leaders of this area last week.

As one of six top-flight business men of this area constituting a discussion panel at the Business Outlook Conference sponsored by the local Chamber of Commerce, Mr. Tibbetts advised his listeners to go ahead in 1949 "with full speed with caution."

In Mr. Tibbetts' opinion, industrial activity is "quiet" in this area and he pointed out that the slow down in foundry work was a direct reflection of the situation. He stated that iron foundries began to feel the drop about 4 months ago and steel foundries soon thereafter with the result that both are now working at only about 50 to 75 pct of capacity.

Responding to an inquiry on the

steel shortage, Mr. Tibbetts said that light gage sheets and tubular products remain tight but that an easing in supply of other items was apparent. He related an instance in which his foundry had to locate a carload of plates for a Denver customer in order to seal a deal for 20,000 lb of castings.

He was firmly of the opinion that a buyers' market was immediately ahead although steel supply would ease only gradually.

Elaborating on his thought that the government would be making a mistake by getting into the steel business now, the speaker said that improvements in techniques, such as use of oxygen in open-hearths and the development of the continuous casting process, would soon make present equipment obsolete and would result in increased capacity which would place an entrepreneur in the vulnerable position of leading with his chin.

One of the biggest problems facing industry today is that of properly informing workers about the fundamentals of business. Mr. Tibbetts said: "I don't think a great percentage of our business leaders understand business and if they don't, how can we expect the men in the plant to understand?" He urged more attention to education of employees on just what profits meant to them as well as to the owners or stockholders and asserted there was little point in "talking to ourselves" about it.

In conclusion, he said that business, faced with wage increases, a buyers' market and increased taxes, must be in a "confused" state.

AFTER hearing other business leaders of both local and national repute, it was difficult to determine the consensus in regard to the future prospects for boom, bust or something in between. Most listeners went away with the feeling that they had "paid their money and could take their choice."

Sumner H. Slichter, professor of economics at Harvard, carefully surrounded his predictions with ample qualifiers to get him safely off of any limb. H. B. McCoy, director of domestic trade, U. S. Dept. of Commerce, was contradictory but inclined toward a slightly pessimistic outlook for 1949. C. E. Earhart, president, 12th Federal Reserve Bank, indicated a tendency of more careful buying. Bryan Houston, director of information for ECA, suggested that the impact of the "Marshall Plan" on business would be of less significance than generally believed.

Harley Leist Lutz, tax consultant for N.A.M., and N. B. Trenham, general manager of the California Taxpayers Assn., roundly condemned the present and proposed tax structures; and Clayton D. Carus, professor, trade and transportation, University of Southern California, humorously and by indirection, made it clear that prognostications based on generalities were of little value.

Higher Ore Tax Proposed

Salt Lake City

• • • The tax on iron ore and non-ferrous metals would be sharply increased by a bill being prepared for introduction into the current legislature. The proposed rates, which may undergo some adjustments before introduction, are 5 pct of net when the ratio of net to gross proceeds is less than 30 to 100; 6 pct of net when the ratio is 30 to 100 or more, but less than 40 to 100; 7 pct of net when the ratio of net to gross is 40 or more, but less than 50 to 100; 8 pct of net when ratio of net to gross is 50 or more to 100.

The proposed tax would be in lieu of a present occupation levy of 1 pct of gross. Some sponsors of the bill favor a lower rate for natural resources processed

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within the state and a downward graduation will probably be offered as an amendment if the change is not made in the original bill.

Proposed rate for oil is 5 pct of net proceeds; for coal, 1¢ per ton, and for other natural resources 2½ pct of net.

Metal Furniture Plant Sold

Los Angeles

• • • **Roll Forming Co.** of Fullerton, Calif., manufacturers of metal furniture, has been purchased by American Type Founders, it has been announced by T. R. Jones, president of ATF.

Roll Forming is headed by T. W. Abernathy, president, and Donald R. Bates, vice-president. No change in management or operating personnel is pending although L. C. Ertle, of ATF, will become comptroller of this western subsidiary. ATF also owns the Daystrom Mfg. Co. of Olean, N. Y. which produces metal tubing of the type used by Roll Forming and some of which has been purchased from local manufacturers. Daystrom maintains sales offices and a warehouse here.

Taxes Threaten Growth

San Francisco

• • • Increasing costs of government, entailing continually increasing taxes, are now "the most

drastic threat to business growth and expansion," according to Alden G. Roach, president of Columbia Steel Co.

Speaking before the San Francisco Bay Area Council, the newly elected steel executive pointed out that California and the West, as well as the local Bay Area, have "also seen increasing evidence of this problem through the expanding volume of tax-exempt, Federally-owned and leased properties."

Recognizing that the "government is now with us to greater degree than ever before," Mr. Roach recommended increased diligence in observing governmental actions and development of co-operative action on legislative or other governmental regulations affecting public and business interests.

Says West to Match East

San Francisco

• • • **Industry in the West** is within 20 years of attaining the industrial position of the East today, according to J. E. Hobson, executive director, Stanford Research Institute.

Addressing the first annual Northern California Research Conference earlier this month, Dr. Hobson made that statement and added: "a fact which is remarkable in view of the 200-year industrial history of the East. Stu-

dents of population density and movement have proved that California is the great magnet drawing the population center of the United States closer to itself each year.

"It has been predicted that Los Angeles, with its sharp incline in population growth, will by 1960 surpass New York City as the nation's largest city. San Francisco, the great western seaport, located near the vast wealth of western natural resources, can expect similar rapid growth and rapid industrial development."

Urging the importance of research by industrialists, he said: "Again we must turn to the research laboratory to help solve problems of air and water supply, waste disposal and problems of contamination and pollution. To meet the growing needs for power and the onrush to the West, utility companies have already spent \$2.3 billions to expand facilities and expect to spend another \$3.3 billions within the next 5 years."

Sets Peak Output Record

San Francisco

• • • **Combined production** of the South San Francisco, Seattle and Los Angeles plants of Bethlehem Pacific Coast Steel Corp. in 1948 was 14 pct higher than in 1947; set an all-time record; and yielded 618,000 tons of steel ingots.

According to H. H. Fuller, president, combined operating rate of his company's 14 furnaces attained 95 pct of capacity during the past year and produced 82,000 tons more steel than in the previous peak year of 1943.

Mr. Fuller, who recently told THE IRON AGE that he expected West Coast steel production to continue to increase through improved operations, said: "In spite of the increasing diversification of orders for steel, we have for 2 years in succession established new highs in steel output. This has been due not only to adding new steelmaking facilities, but also to the improvement we have made in plant operations. We expect to continue to improve operating efficiency and to even further expand our steelmaking facilities and we now look to 1949 as another record-breaking year in steel production for Bethlehem Pacific."

CONVERSION: Emory Stanfield of Los Angeles drives a converted P-38 - belly tank completed a few months ago at a cost of \$400. Licensed by the state in the motorcycle classification, the contraption is 13 ft long, weighs about 500 lb. and cruises at 40 to 45 mph.



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Levinson Sales Engineers have found that placing fabricated metal contracts is not always as easy as it seems. When you consider the endless types of metal fabrication and the various kinds of metals, you can readily appreciate the many problems that arise.

Levinson now has a new department designed to handle such metal fabrication problems. These new facilities enable us to study your requirements with you, help determine the most economical method to use, and, in many cases, see to it that your job is done with a minimum of difficulty and at the lowest possible cost, regardless of the metals or processes used.

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The

LEVINSON STEEL COMPANY

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A. E. VAN CLEVE, vice-president, Crucible Steel Co. of America.

• **A. E. Van Cleve** has been appointed a vice-president and transferred to the sales department of Crucible Steel Co. of America, New York. Mr. Van Cleve, formerly plant manager of Crucible's Atha Works in Harrison, N. J., has been with the company since 1910.

• **Charles H. Williams, Jr.**, has been made superintendent of wire mills, Pittsburgh Steel Co., Pittsburgh. Mr. Williams entered the employ of the company in 1931 and has been assistant superintendent of wire mills since 1945.

• **A. L. Hawley** has been appointed works manager of the main factory of Plomb Tool Co. in Los Angeles. Mr. Hawley joined the company in 1936, working successively in the machine shop, tool room and engineering department, serving as assistant factory superintendent, superintendent of time study, chief engineer and assistant works manager.

• **Richard Hubler** has become associated with the Imperial Bolt & Screw Co., Inc., New York, in the capacity of sales manager in the hardware division.

• **Otto A. Pfaff**, president of American Wheelabrator & Equipment Corp., Mishawaka, Ind., has been elected to the board of directors of Signode Steel Strapping Co., Chicago.

PERSONALS

• • •

• **M. W. Reed**, who formerly served as chief engineer, has been appointed vice-president, engineering, U. S. Steel Corp. of Delaware, succeeding **B. H. Lawrence**, who is retiring after 44 years of service with U. S. Steel. Mr. Reed has served with subsidiaries of the corporation since 1916.

• **C. A. Scharschu**, director of research of Allegheny Ludlum Steel Corp., Pittsburgh, has been appointed assistant technical director. He has been succeeded as director of research by **L. C. Hicks**, who formerly served as associate director of research. Mr. Scharschu has been associated with Allegheny Ludlum since 1929, when he joined the former Allegheny Steel Co. as chief metallurgist and director of research. Dr. Hicks has been employed in the company's research department since 1933.

• **Matthew J. Donachie** has been appointed works manager of the Beryllium Corp., Reading, Pa. Mr. Donachie has been associated with the company in various consulting capacities since 1935.

• **Derrick L. Brewster** has been named as an additional assistant district sales manager of Inland Steel Co.'s Chicago district sales office. Mr. Brewster joined the company in 1945 as a sales representative.

• **Paul D. Merica**, vice-president of International Nickel Co. of Canada, Ltd., has been elected a director of American Metal Co., Ltd., New York, filling a vacancy caused by the resignation of **Robert C. Stanley**.

• **Howard E. Pellett** has been appointed sales engineer, covering California, Nevada and Arizona, for Riehle Testing Machines division of American Machine & Metals, Inc., East Moline, Ill., with headquarters in San Francisco and Los Angeles. Before joining Riehle, Mr. Pellett served as research supervisor for Republic Steel Corp.



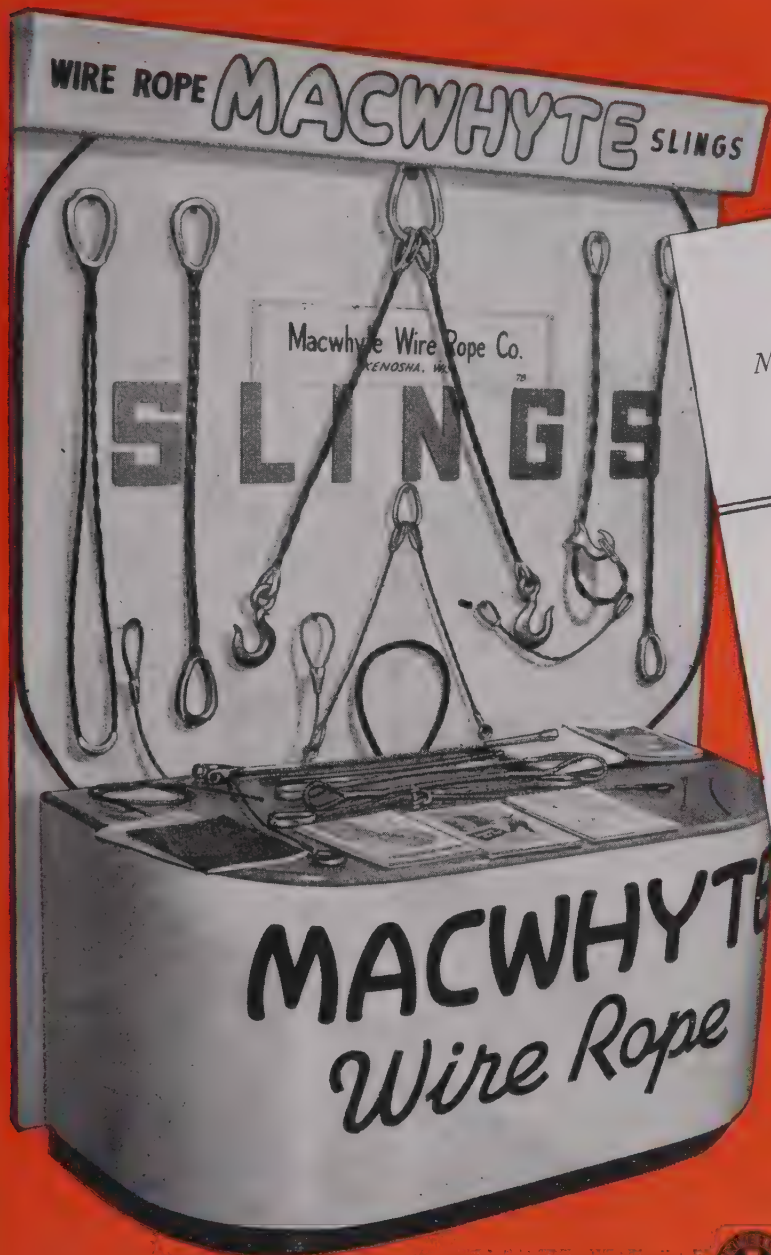
HARRY D. SWEENEY, sales manager, American Manganese Steel Div., American Brake Shoe Co.

• **Harry D. Sweeney**, formerly sales engineer, has been appointed sales manager of welding products for the American Manganese Steel Div., American Brake Shoe Co., New York. Mr. Sweeney has been with Brake Shoe since 1945 and had previously been associated with Acme Steel Co. He continues to be located at the divisions' headquarters in Chicago Heights, Ill.

• **J. B. Owen** has been made assistant manager of sales and **V. M. deCastro**, assistant to the president, Edgcomb Steel Co., Philadelphia. Mr. Owen joined the company five years ago, having previously served with Armco Steel Corp., and prior to his recent appointment had been manager of stainless sales. Mr. deCastro has been associated with Edgcomb for 12 years in various capacities.

• **Charles Fette** has retired as superintendent of the butt weld and continuous tube mills, Youngstown district steel plant of Republic Steel Corp. **Roy Case** has been named to succeed him. Mr. Fette joined Republic in 1934. Mr. Case joined the company in 1928 and has been assistant superintendent of the butt and continuous tube mills since 1937.

• **Glenn C. Shively** has been appointed purchasing agent of Superior Steel & Malleable Castings Co., Benton Harbor, Mich.



From
SAFETY DIRECTOR

Memo to:

General Superintendent
Plant Engineer
Purchasing Agent

I saw this display of Macwhyte Braided Wire Rope Slings. They are being used by hundreds of companies for handling all types of loads with safety, ease, and economy. I think we could use these slings to good advantage in our plant. Let's ask Macwhyte to have one of their Sling Engineers consult with us regarding our load handling problems.

Member National Safety Council



Macwhyte Slings are made to meet your requirements in any capacity, length, and design. Ask for a Macwhyte engineer to help select the proper slings for your use.

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2911 Fourteenth Avenue, Kenosha, Wisconsin

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cable and Assemblies, Stainless Steel and Monel Metal Wire Ropes. Catalog on request.

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There's a Macwhyte Sling that's the right sling for any load.

NO. 952-G



HUGH W. WRIGHT (left), director, public relations, and **R. G. ADAIR** (right), director, personal relations, Armco Steel Corp.

• **Hugh W. Wright** has been appointed director of public relations and **R. G. Adair**, director of personal relations, Armco Steel Corp., Middletown, Ohio. Mr. Wright and Mr. Adair joined Armco in 1916. Mr. Wright formerly supervised the company's public relations and Mr. Adair served as assistant director on the company's personal relations staff.

• **W. B. Pickard**, formerly manager, has been made vice-president of the American Metal Hose Div., American Brass Co., Waterbury, Conn. **Carl Woodward**, assistant manager, has been appointed eastern sales manager and **A. B. Freeman**, formerly manager of the central district, has been made western sales manager.

• **Robert L. Hallett**, formerly mining engineer and chief chemist for the National Lead Co., has become associated with **Arnold H. Miller**, Consulting Engineer, New York, in the practice of mining, metallurgical and industrial engineering.

• **Charles W. Carroll** has been made vice-president and sales manager of Haarmann Steel Co., Holyoke, Mass., succeeding **T. K. O'Connor**, who died. **Harry L. Hunt** has been made contracting engineer, succeeding Mr. Carroll.

• **W. C. Leasure** has been appointed district sales manager in charge of the new sales office in Houston of the Syntrol Co., Homer City, Pa. **Nelson C. DeVilling**, formerly of the Pittsburgh sales office, has been promoted to district sales manager of the new sales office in Dallas. **Dick McHale**, of the company's Chicago office, has been promoted to district sales manager of the Los Angeles office. **James B. Barth** has been appointed to replace Mr. DeVilling on the staff of the Pittsburgh sales force, and **G. R. Stocum** is taking over Mr. Hale's duties in the Chicago sales office. **D. E. Nugent** has been appointed to take over power tools sales in the Kansas City office.

• **B. O. Stoothoff** has been appointed special representative of the Cleco Div., Reed Roller Bit Co., located in Cincinnati.

• **John S. Andrews** has become associated with Zimmer-Lightbody Industries, Inc., Detroit. Mr. Andrews had formerly been connected with Republic Steel Corp. and Rotary Electric Steel Co.

• **Frank A. Luebke** has been elected vice-president and general sales manager of Nichols Wire & Aluminum Co., Davenport, Iowa. Mr. Luebke has been general sales manager of the company for the last five years.

• **A. C. Staley, Jr.**, has been named assistant general manager of sales for the American Can Co., New York. Mr. Staley had formerly been sales manager for the metropolitan New York district.

• **H. C. Larson**, assistant metallurgical engineer, Bethlehem Steel Co., Bethlehem, has been appointed metallurgical engineer and secretary of plant committees dealing with the technical factors involved in steel plant operations.

• **R. L. deBrauwere** has been elected assistant vice-president of the Scoville Mfg. Co., Waterbury, Conn. He continues to serve as assistant secretary of the company and as secretary and director of A. Schrader's Son, Inc., Brooklyn.

• **Lewis S. Bergen** has been appointed executive assistant to the president of Pullman-Standard Car Mfg. Co., with headquarters in the Chicago office. Mr. Bergen formerly served as special assistant to the president in the New York offices.

• **Burton S. Wolff** has been elected president and treasurer of Benjamin Wolff & Co., Chicago and Milwaukee. Mr. Wolff had served as vice-president since 1927. **C. D. Engstrom**, formerly assistant to the vice-president, has been named vice-president in charge of operations. He has been with the Wolff organization since 1937. **Jack May**, who started with the company as a salesman in 1936, has been made vice-president in charge of sales. He had formerly served as manager of sales. **M. W. Young** has been elected secretary and **Seymour Oseas** assistant treasurer and assistant secretary.

• **John W. Coltman** has been named manager of the electronics and nuclear physics department at the research laboratories of the Westinghouse Electric Corp., Pittsburgh. Dr. Coltman, former head of the x-ray section of the laboratories, succeeds Dr. William E. Shoupp. **V. B. Baker** has been appointed manager of the general mill section of the industry engineering department of Westinghouse, East Pittsburgh Works, succeeding **J. C. Fink**.

• **J. W. L. Stone** has been appointed district manager of a newly-formed sales district at Omaha for the Peerless Pump division, Food Machinery & Chemical Corp. Mr. Stone formerly served as field engineer for that division in the southwest district.

• **J. E. Donovan** has been made district manager in charge of the San Francisco branch of Mack Trucks, Inc. **J. W. Biggins** has been appointed district manager at Louisville; **H. J. Fikejs** has become district manager at Kansas City; **T. J. Colter** has been named district manager at Milwaukee; **A. P. Cowles** has been appointed district manager in Springfield, Mass., and **R. J. McGivney** has been made district manager at Worcester, Mass.

• **Joseph A. Neubauer** has been appointed technical director for the Columbia Chemical Div., Pittsburgh Plate Glass Co., and for Southern Alkali Corp. Mr. Neubauer has his headquarters at the Columbia Chemical division's Pittsburgh offices.

• **Clyde Moyer** has been appointed Philadelphia district representative of the Testing Equipment Dept., Baldwin Locomotive Works, Philadelphia, replacing **Roger Schofield**.

• **Edwin P. Weese**, who has served as vice-president and operating head of the Carbon Concrete Brick Co., a subsidiary of the Carbon Limestone Co., has been advanced to also assume the position of vice-president in charge of operations of the Carbon Limestone Co., Youngstown. **Philip E. Heim**, manager of Agstone Sales of Carbon Limestone, has been named vice-president in charge of sales of the latter company.

• **William Davey**, formerly general manager of the Curtiss Wright Corp. plants in Buffalo, has been elected president of the newly-organized American Aldehyde Corp.

• **Robert P. Smith** has been appointed to represent the Standard Transformer Co., Warren, Ohio, in the state of Florida.



O. O. LEWIS, sales manager, Fairbanks, Morse & Co.

• **O. O. Lewis**, formerly assistant sales manager, has been made sales manager, Fairbanks-Morse & Co., Chicago. **Harry L. Hilleary**, who for the past 17 years has been manager of the St. Louis branch, has been transferred to the company's headquarters in Chicago and promoted to the position of assistant sales manager. **L. A. Weom**, manager of the pump division, has been transferred to St. Louis to become branch house manager, succeeding Mr. Hilleary. **Donald T. Johnstone**, assistant manager of the pump division, succeeds Mr. Weom as manager of the corporation's pump division, with his headquarters in Chicago.

• **Edmund C. Thompson** has been named assistant to the manager of customer engineering, International Business Machines Corp., New York. He had previously served as manager of customer engineering in Kansas City.

• **Fred H. Rockwell** has been appointed general freight traffic manager, Santa Fe Railway, succeeding **T. L. Bothwell**, who has retired. Mr. Rockwell joined the Santa Fe at Los Angeles in 1917. He was made assistant to the traffic vice-president at Chicago in 1942 and acting general traffic manager in 1948, the position he held at the time of his new appointment.



M. A. HUNTER, vice-president, Federal-Mogul Corp.

• **M. A. Hunter** has been appointed vice-president in charge of manufacturing, Federal-Mogul Corp., Detroit. He has been with the company since 1925. Mr. Hunter also serves on the board of directors. **Ernest R. Darby** has been named vice-president in charge of research. He has been with the company 20 years. **Rogers I. Marquis**, vice-president in charge of industrial relations, joined Federal-Mogul in 1945. **Neil A. Moore**, vice-president in charge of the Federal-Mogul service division, joined the company recently, coming from Sealed Power Corp.

• **J. H. Gauss** has been appointed assistant manager of sales of the Locomotive and Car Equipment divisions of the General Electric Co., Erie, Pa. Mr. Gauss has been connected with the company for 11 years.

• **Erwin J. Schmiel** and **Ralph O. Wirttemberg** were appointed secretary-treasurer and sales manager of the Norma-Hoffman Bearings Corp., Stamford, Conn. Mr. Schmiel succeeds **Edward C. Lennon**, who is retiring after 35 years of service. He was most recently general auditor of Elastic Stop Nut Corp. Mr. Wirttemberg succeeds **Frederick W. Mesinger**, who has resigned. He formerly served as eastern regional sales manager of New Departure Div., General Motors Corp.



E. K. MILLER, assistant vice-president, operations, Jones & Laughlin Steel Corp.

• **E. K. Miller**, formerly assistant to the vice-president, operations, has been appointed assistant vice-president, operations, Jones & Laughlin Steel Corp., Pittsburgh. Mr. Miller joined J&L at the Aliquippa Works in 1929 as superintendent of steel works and was later promoted to the positions of assistant general superintendent and general superintendent there.

• **Lloyd H. Skougor** has been appointed general manager of Ekholm Associates of New York.

• **J. S. Overstreet** has been named manager of sales in the Wire & Cable Div., Construction Materials Dept., General Electric, Bridgeport, Conn. He joined GE in 1929 and since 1945 has served as manager of cable sales. **R. P. Allison** has been appointed manager of manufacturing of that division. He joined the company in 1935 and since then has been a methods engineer and has held the position of works manager of the Poughkeepsie and Lowell plants. **C. O. Hull** has been appointed manager of Bridgeport engineering of the division. He has served the company since 1922. **V. A. Sheals** has been made manager of Schenectady engineering. He has been with the company since 1921. **T. R. Hancock** has been appointed manager of the marketing research division of the construction materials department. He joined the company in 1946. **J. E. Neuberger** has been appointed operating manager of the Advertising Div. of that department. He became associated with the company in 1930. Prior to his present appointment he was account man for wire and cable and rectifier accounts. **E. N. Kimball, Jr.**, has been made manager of the procedures division. Mr. Kimball has been with GE since 1947. **Murray H. Owen** has been appointed to the staff of the manager of sales of the construction materials department.



M. H. FREEDMAN, manager, Pacific Northwest Div., Columbia Steel Co.

• **M. H. Freedman** has been named manager of the Pacific Northwest Div., Columbia Steel Co., responsible for sales in Washington, Oregon and northern Idaho. **C. C. Johns** becomes manager of sales at Portland and **Ralph Winship** has been named to a similar position in Seattle. Mr. Freedman has been associated with the U. S. Steel Corp. in San Francisco since 1920 and in 1931 became salesman for Columbia at Seattle and was later advanced to assistant manager and then manager of sales.

(CONTINUED ON PAGE 136)

OBITUARY...

• **J. H. Morrison**, 56, vice-president and director, Pittsburgh Steel Co., Pittsburgh, died Jan. 18.

• **William L. Stancliffe**, formerly vice-president in charge of sales, American Car & Foundry Co., New York, died Jan. 16.

• **Charles C. Carr**, 66, veteran ordnance manufacturing expert associated with R. K. LeBlond Machine Tool Co., Cincinnati, died Jan. 8.

• **Wallace C. Moulton**, 78, formerly superintendent of furnaces and coke ovens at Birmingham for Republic Steel Corp., died Jan. 11 in Atlanta.

• **David P. Hopkins**, 81, retired vice-president in charge of operations and director of U. S. Pipe & Foundry Co., Burlington, N. J., died Jan. 13. His association with that company and its predecessor, the Addyston Pipe & Steel Co., extended over a period of 54 years.

• **David A. Nemser**, 51, metallurgist and head of the New England technical section of the development and research division of International Nickel Co. Inc., Hartford, died Jan. 5.

• **Harrison B. Hoyle**, 85, founder of Standard Foundry Co., Worcester, died Jan. 7.

• **W. Wallace Kemp**, president, C. M. Kemp Mfg. Co., Baltimore, died recently.

• **Edward E. Eisenwinter**, engineering manager, American Brass Co., Waterbury, Conn., died Dec. 21.

• **Harold T. Sprague**, 63, retired head of the turbine material department, General Electric Co., Lynn, Mass., died Jan. 5.

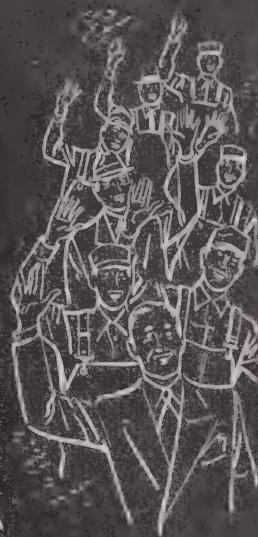
• **Marshall M. Phinney**, 79, formerly vice-president, Stone & Webster Management Co., Boston, died Jan. 6.

• **A. K. Lewis**, 73, retired assistant to vice-president, Armco Steel Corp., Middletown, Ohio, died Jan. 10.

• **John J. Bechtold**, 79, president, New York Brass Foundry Co., New York, died Jan. 7.

"RELIANCE OK" .. P. A.

"Our shop men are
all unanimous about
the consistent uni-
formity and depend-
able quality of your
steel."



Quotation Reproduced From A Letter in Our Files

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OUR CUSTOMERS' MAN

Here is Reliance Service in action from the P. A's angle . . . in his own words.

"We feel we have been given a fair share of materials . . ." "Your steel is preferred by the men in our shop" . . . "Your service far above the average warehouse in this area" . . . "Your timely assistance kept our plants operating" . . . "You have been doing everything possible under present conditions" . . . "In a pinch we can depend on Reliance coming through" . . . "You have gone all-out" . . . "You helped us out of a bad situation." . . . etc. . . . etc.

Reliance is constantly planning and working toward greater production and supply . . . towards higher standards of steel service.

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CORPORATION**

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STRIP STEEL—Cut Lengths . . . SHEETS—Hot Rolled . . . Hot Rolled
Pickled . . . Cold Rolled . . . Long Terne . . . Galvanized.

European Letter . . .

• Brussels Powers must clarify world views on Western union . . . Universal non-Communist resources necessary to check Communist expansion . . . Strong central authority would forge weak, divided states of western Europe.



LONDON — It is a year since Mr. Bevin made his speech declaring that the time for western association was ripe. During the intervening months, many steps towards greater unity have been taken. The Five Power Brussels Pact has been signed, the Organization for European Economic Cooperation has come into being, discussions for a North Atlantic Defense Pact have begun and the preliminary negotiations on the establishment of a European Assembly have taken place. For a year's work, much would seem to have been achieved. Yet there are few issues of policy upon which men's minds are more confused. "Western Union" seems to convey totally different and indeed opposite things to different people; and as a result of this divergence of aim and interpretation, there is equal variety in the methods proposed for developing the institutions of a possible western association. It is difficult to believe that clear policies and an effective organization can emerge from so much uncertainty, and the first task of the Brussels Powers when they meet in Paris to discuss the creation of institutions for western Europe is to be certain that

they are pursuing the same objective and that their motives coincide.

At present two strong and opposite views dispute the purpose of Western Union. One sees it as an extension into a troubled continent of the security and solidarity which ought to underpin the whole western world. Militarily, western Europe is one end of the Atlantic Defense Pact. Economically, it should be linked indissolubly with the great markets and great sources of raw materials in the western hemisphere and the Commonwealth. According to this school of thought, the chief aim of unifying western Europe is to make it strong enough to become a pillar of the free world, instead of a crumbling wall which has to be shored up from outside.

The second view, which appears under a variety of forms, is diametrically opposed to the idea of Europe as an integral part of a free worldwide western system. On the contrary, it holds that western Europe and later perhaps all Europe must cut itself off from the orbit of both Great Powers, whose influence is dismissed as equally imperialist and equally malignant and by turning itself into a well organized union, become a third great power capable of holding the balance between east and west. This view is sup-

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ported by many who do not go so far as to put the United States on the same footing as Russia. They simply argue that war between the two blocs is inevitable, and that a strong unified Europe would have a better chance of staying neutral.

These various forms of 'independence-through-union,' have a strong attraction for a very widespread attitude of mind towards international relations—that of isolationism. The instinct not to be bothered with foreigners is so deeply rooted that it colors the

most unlikely policies and appears under almost unrecognizable disguises. There is more than a trace of isolationism in those who want Europe to cut loose from both Russia and the United States. It underlies General de Gaulle's desire to run Europe without Britain. Equally it appears in Dr. Dalton's earlier and Lord Beaverbrook's present preference of the Empire to Western Union.

THIS issue must clearly be decided before any genuine progress towards Western Union can be made. No forms of organization will hold the nations together if their purposes in setting them up are contradictory. The plans and institutions which fit an isolated, selfsufficient and neutral Europe are of necessity different from those which would link an integrated western Europe to the wider western community. Western Europe's part in the field of world politics must therefore be the starting point for any useful decisions on Western Union. And of this, can there be any doubt today? In the last two years, the impact of Russia and America respectively on Europe have become clear to all whom dogma does not blind. The picture of an imperialist America battening on Europe has become sheer nonsense in the light of the unconditional generosity of the Marshall Plan, and of the swing in American politics towards radicalism in domestic affairs. During the same period, the brutality of the police state has become more and more the hallmark of any area to which Soviet power extends, and all hope that Communists anywhere can become incorporated in constitutional democracy has vanished. Europe, in short, faces a straight choice between freedom, experiment and the possibility of growth or the totalitarian straitjacket. Moreover, the cold war to decide this alternative is not engaged only in Europe. Until the impetus of Communist expansion slackens, the

threat is a world wide threat, and it demands all the resources of the non-Communist world to check it and in time to thrust it back.

This is the tragic background to the talks on Western Union. To talk of isolating Europe from the United States, the Commonwealth and the rest of the free world is in fact to propose its transfer to the Russian orbit. Militarily, the balance of power has been so disturbed by Russia's advance to the Elbe that American might alone can redress the balance. Economically, the year's work at OEEC has proved that to maintain a standard of living sufficient to defeat Communist mining from within, Europe must depend on the new world for a decade to come. In a word, the reason for unifying what is left of Europe is to hold a beleaguered outpost of the free community, not to create a little isolated organism.

THIS conclusion inevitably affects the type of organization which should be set up to express western association. At present, three different kinds of institution are under discussion. At one end of the scale lies full federal union, with universal suffrage for a central government to which would be entrusted certain essential powers. At the other, lies the French proposal that a European assembly should be set up with none but advisory powers, not to govern Europe but to express "the European idea." Somewhere in between lie the British proposals that a council of ministers should be established to reach joint conclusions on matters of vital concern, particularly in the military and economic sphere, and that it should be flanked by a consultative assembly representing governments.

The first of these solutions would be appropriate only if the aim of Western Union were to set up a third great power. A strong central authority, controlling many of the vital interests of the member states, might strengthen the internal links between the states of western Europe, although the strain imposed on ingrained nationalism would be immense. But it would certainly and irretrievably weaken western Europe's links with the rest of the western world. Great Britain



STEEL FOR WOOD: *Telegraph poles made from mild steel plate are being pressed into service in London because of a wood shortage. Here one of the poles is being assembled. Note the new rounded fitment at the top, a change from the familiar crosspiece.*

would have virtually to cut its connection with the Dominions (to leave Britain out of the union would entail domination by Germany) and the existence of a single west European state would encourage America to move towards isolationism and irresponsibility. Instead of helping the free world to transcend the limits of state sovereignty, it would simply create one more powerful state to exercise sovereignty.

The concept of an assembly for Europe falls short for the opposite reason. To make their proper contribution to the security and the prosperity of the free world, the nations of western Europe are too small, weak and divided. At present, they are virtually the only group of sovereign nations unattached to a wider political association. The United States is itself a federation. Britain and the Dominions form a Commonwealth. Even Latin America has its system of hemispheric consultation and defense. Only the nations of western Europe stand alone and a mere assembly is not going to mend their weakness and ineffectiveness. An assembly will not strengthen and organize the European end of the Atlantic Pact. An

assembly will not reinforce the economic powers of the OEEC. An assembly will not realize the extension of international control over west European industry.

On balance, therefore, it would seem that the British proposals best suit the real needs of western Europe. A Council of Ministers meeting regularly with the full weight of their cabinets behind them could sacrifice sovereignty in favor of common European institutions, such as, for instance, an enlarged Ruhr authority. But it could go further and make such transfers of power as are necessary to set up institutions representing the whole free world—an International Atomic Energy Authority, for instance, or a world Chiefs of Staff Committee.

SIMILARLY in the economic field, a Council of Ministers, could stimulate and rationalize European production and exports, but it could also enter into longterm economic agreements, in markets, on prices, on currency stabilization, with its great trading partners overseas. In short, such a council would not create a new block of obstinate sovereignty in Europe, but it could press forward in the process of "getting mixed up together" with the other partners in the western world. If a consultative assembly were also established to canalize public opinion and to express the peoples' aspirations towards greater unity, the existence of a functioning council would save it from futility and a responsible political organ would exist to which it could direct its recommendations and which it could influence by its debates.

To those who long for neat formulas and precise definitions of sovereignty, the British plan will no doubt seem nebulous and inadequate. But in a community so vast and various as the western world, in a system in which freedom and experiment are the essence of political action, in what is virtually an attempt to evolve institutions for world government, the tidy blue print and the detailed constitution are out of place. The British plan may suffer from the almost grudging way in which it has been worked out, but it remains the most reasonable approach so far evolved to the problem of creating institutions for Europe.

• **PRICE UPSET**—In some larger sizes, published prices of seamless tubing are lower, in small quantities, than those of welded tubing. Some price cutting of welded tubing has developed in cases where the business might otherwise go to seamless. The development grew out of the new schedule of quantity extras that welded tube producers put into effect in November. Seamless tube mills have not increased quantity extras. The increases put into effect at an earlier date were 9½ pct. on base price and extras for welded tubing, and 10 pct on base price only for seamless. Deliveries are extended for welded tubing because of the shortage of stainless strip.

• **U. S. STEEL EARNINGS**—U. S. Steel reports net income of \$41,510,274 or \$4.05 per share for the fourth quarter of 1948 this compares with \$31,215,636 or \$2.86 a share for the fourth quarter of 1947. For the year 1948 net income was \$129,552,424 or \$11.99 a share compared with net income in 1947 of \$127,098,148. Shipments in 1948 were 20,597,570 net tons compared with 20,241,706 for the year 1947. On May 2, 1949 stockholders will be asked to authorize a 3 to 1 common stock split.

• **PRICE RESISTANCE**—Steel and iron foundries report that buyers resistance to price has changed to manufacturers resistance. Foundries are being asked to lower their prices on many types of castings. So far most foundries have been stoutly resisting—but some foundry executives believe they will soon have to give in.

• **FEELING BETTER**—For the first time in months, warehousemen are feeling better. Some admit that they have such a thing called inventory. Steel producers, however, will not admit that shipments of steel to warehouses have improved. Last week one warehouse offered two additional tons of sheets to one of its best customers.

• **ELECTROLYTIC MANGANESE DOWN**—Electro Manganese Corp., Minneapolis, reduced the price of electrolytic manganese 4¢ a lb effective Jan. 1. This makes the new price f.o.b. Knoxville, Tenn., freight allowed east to the Mississippi, carload lots, 28¢ per lb; ton lots, 30¢ per lb; less ton lots, 32¢ per lb.

• **SLIPPING**—One of the largest structural producers in the Chicago area reports that for the fourth consecutive week shipments have far outnumbered even inquiries, and the company's backlogs are fast disappearing.

• **ORE CONSUMPTION**—United States and Canadian blast furnaces consumed 7,351,059 gross tons of Lake Superior district iron ore in December, highest monthly consumption of 1948, according to the Lake Superior Iron Ore Assn. December consumption raised 1948 U. S. consumption of Lake Superior district iron ore to 77,661,343 gross tons which, with Canadian consumption, brought the 1948 grand total to 80,504,215 gross tons. The report showed stocks of iron ore on hand at furnaces and Lake Erie docks Jan. 1 totaled 39,460,497 gross tons, compared with 45,160,225 tons a month ago and 36,094,870 gross tons on Jan. 1, 1948.

• **MARKET QUIET**—Mills and warehouses are still finding the stainless sheet market inactive, a downtrend that began in the third quarter. Prices and functional discounts of mills and independents are now uniform, with minor variations in packing extras. Deliveries on chrome-nickel sheets are set at 8 weeks, with the possibility of delivery in 4 to 6 weeks. Straight chromium grades are 2 to 3 weeks longer. Strip is tighter. Straight chromium grades require 17 weeks for delivery.

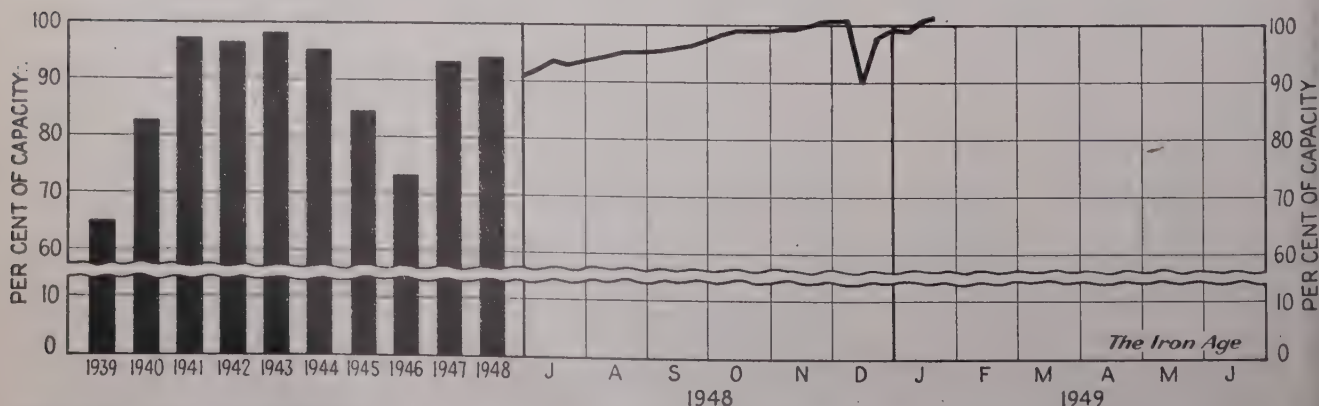
• **CHANGES EXTRAS**—Inland Steel Co., on Jan. 17 revised their galvanized coating extras. The change was made to reflect the varying amounts of spelter used per ton of sheets to produce the various gages of galvanized sheets and forms of roofing and siding. The coating extras were effective on shipments made on and after Jan. 17 and vary with gage.

• **UNDER THE COUNTER**—The Independent Petroleum Assn., in a recently completed survey of their members, reports that 28 pct of their steel pipe needs were obtained last year through irregular channels. These channels, conversion and gray market, were responsible for prices which averaged 140 pct above standard mill price.

• **LAYOFF**—Crane Co. in Chicago, which recently was reported as having reduced operations to 4 days a week, has advised that the reduction is less than 4 pct of their total production. They told THE IRON AGE that all items which were formerly in tight supply are not available out of stock.

• **NEW MILL**—Western Reserve Steel Co., Madison, Ill., who are building a new seamless tube mill (see p. 123) are after additional power. They have approached Commonwealth Edison Co., Chicago, inquiring about more power to run the four 60,000 KVA welders they intend to install.

Steel Ingot Production by Districts and Per Cent of Capacity



- **Signs Point to Normal Market**
- **Scrap Market Is Still Wobbly**
- **New England Wants More Steel**

THERE are more signs this week that the steel industry is on its way to a normal market. Scrap is more plentiful, pig iron output is higher and the unusual pressure from customers is on the wane. This does not mean that the "great day" has arrived—when the steel buyer can place his order and get it in a few weeks.

This week it looks as if steel consumers, while crying for more steel on one hand, are with the other taking close check on their supplies. None want to show up with heavy inventories if later in the year a "belt tightening" phase sets in. In all the welter of gossip, guesses, chartist statements and sales reports it appears that the steel business is reaching a plateau in the unusual demand of the last few years and is poised for a market based on growth and replacements.

The downward movement of scrap prices is alarming some people this week. But others agree that for the first time since before the war scrap grades are coming into better balance price-wise. Recent purchases have served to place a price differential between No. 1 heavy melting steel scrap—a prime grade before the war—and No. 2 heavy melting which generally is not as good as the prime grade.

In Pittsburgh, Chicago and Philadelphia, leading scrap consumption markets, the prewar differential has been established. The actual difference between the two grades is now greater than it was in 1939. But market conditions will take care of this.

A drop of \$1 a ton in No. 1 heavy melting steel in Philadelphia caused THE IRON AGE scrap composite price to ease off to \$40.58 a gross ton. This is a decrease of 34¢ a gross ton from the price a week ago. This price has dropped \$2.42 a gross ton during the past month.

THERE is no sign that the scrap market will slide off the deep end in the near future. But it is clear that the good weather, the heavy stocks and the increase in pig iron output will force a sensitive situation price-wise. It can be expected that consumer pressure will stay on scrap prices. Already this pressure has been responsible for the substantial drop in the price of No. 2 steel. After all most steel companies use this scrap, and this week it is costing on the average about \$4 a ton less than a month ago. No. 1 is costing more than \$2 a ton less than a few weeks ago. But there has been an additional saving from use of No. 1 heavy melting—because the grade is better which means more tons of steel per ton of scrap.

This week the steel industry astounded even

its worst critics by making steel at an annual rate of 97 million tons of steel ingots. This rate cannot continue for months on end—but it can, and probably will, stay close to that rate for many months. And that will go a long way towards folding up any arguments—for the time being—that the government should get into the steel business.

The steel ingot rate this week is 101 pct of rated capacity up one point from a week ago. The full force of more scrap, more pig iron, more capacity, better coal and coke and a good repair cycle is doing the work for the industry at a time when it needs a friend in court.

The high rate of steelmaking continues to wear away at gray market and conversion activity. Prices in the gray market have slipped more than \$100 a ton on some items during the past few months. In some cases there are still no takers. Conversion arrangements remain standard operations, especially with oil equipment and auto people. But fringe conversion customers are being trimmed, except for small spot tonnages to keep operations going.

RECENT developments in steel have added new zip to the efforts of New Englanders to increase steelmaking facilities there. Yankee ingenuity is on the prowl again—this time backed by figures. Hub of the newest and strongest effort is the New England Council.

This organization has the figures to show that: (1) New England produces only one fourth to one third of the steel it consumes, (2) the change to f.o.b. mill selling has created a "protected market" in New England and (3) raw material logistics point to this region as a natural for more steel output.

The New England Council, like a lot of other people, is convinced that a new integrated mill will eventually be built somewhere on East Coast tide water. They want it in New England. Even more than that they'd like to have: (1) more openhearth, supplied with New England scrap and possibly Canadian pig iron, (2) they are considering firing them with natural gas, which is on the way and (3) they are investigating possibilities of continuous casting of the semifinished steel and have been assured that it will be ready for licensing within a year.

Statistics are their biggest weapon. They were used this week in a conference with one of the major producers. A second conference is already planned with another large producer. Others are in the making. This group may not get all they want, but they are certainly using the right arguments.

MECHANISM OF PROTECTIVE ACTION IN

Galvanizing

IRON AND STEEL products are galvanized, or coated with zinc, in order to prevent rusting. Rusting is an electrochemical action in which iron replaces hydrogen, or a metal, in a dilute electrolyte — a solution which conducts electricity. The presence of carbon dioxide, sulfur oxides and small amounts of salt make the moisture in the air such an electrolyte.

Each metal or alloy has its own definite activity, or ability to replace hydrogen or other metals in electrolytes; this property is termed its electro-potential. A list of the metals arranged in increasing order of activity, with their electro-potential expressed in volts, is called the Electromotive Series. The voltage figures at the left-hand side of the table, for example, show that a force of 0.34 volt is the cause of the replacement of hydrogen from an acid solution by iron. Zinc, being far more active, a force of 0.77 volt acts to drive hydrogen out of an acid solution. For convenience, the zero point has been placed at iron and the figures, since they are relative only, have been transposed to show — at the right-hand side of the table — the activity of the metals relative to iron. Tin, for example, has less tendency to go into solution, and therefore rust, than iron, while in zinc the tendency is greater. This property of zinc is the reason why it is preferred as a protective coating for iron and steel.

For economic or mechanical reasons, the protective coating should be thin, and a thin coating is apt to be imperfect due to scratches, pits and other breaks in the surface. At these openings the corrosive electrolyte comes in contact with the iron and the coating metal. If the coating metal is tin, as in Figure I, a positive potential of 0.15. volt causes the *iron* to move into solution while the tin, being less active, has no tendency to dissolve. If the coating metal is zinc however, as in Figure II, a negative potential of 0.43 volt pulls the *zinc* into solution; there is no tendency at all for the exposed iron to dissolve or rust while any zinc remains near the break in the surface. This "sacrificial" protective action by zinc is the main reason for its universal adoption for the rust-proofing of iron and steel products. In 1947, 359,583 tons of zinc, representing 46% of all the zinc consumed in the United States, has been used for galvanizing.

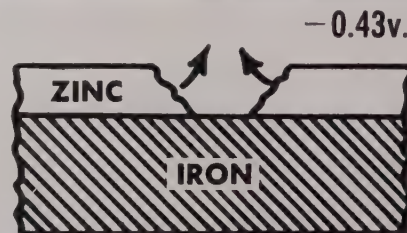
VOLTS:

Vs. H ₂		Vs. Iron
+ 1.08	Gold	+ 1.42
+ 0.86	Platinum	+ 1.20
+ 0.77	Silver	+ 1.10
+ 0.34	Copper	+ 0.68
0	Hydrogen	+ 0.34
- 0.15	Lead	+ 0.19
- 0.19	Tin	+ 0.15
- 0.23	Nickel	+ 0.11
- 0.34	Iron	0
- 0.42	Cadmium	- 0.08
- 0.50	Chromium	- 0.16
- 0.59	80% Zn, 20% Fe	- 0.25
- 0.65	90% Zn, 10% Fe	- 0.31
- 0.77	Zinc	- 0.43
- 1.28	Aluminum	- 0.94

Electromotive Series from *GALVANIZING HANDBOOK*,
J. R. Daesen



I. Metal positive to Iron



II. Metal negative to Iron



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New England Industrialists Say "Do or Die" on Steel Plant Hopes

Boston

• • • Powerful forces are at work to expand the steel capacity of New England. Whether these efforts will result in the building of a fully integrated steel plant in this 6-state area is presently a highly controversial subject—even in New England. But even the conservative elements here are firmly convinced that more steel-making and finishing facilities in the first frontier of the nation are a foregone conclusion.

Organizational hub of the efforts to increase steelmaking capacity here is the New England Council. This is a unique group. It is composed of industrial, commercial, agricultural and professional leaders. It is like a chamber of commerce, except that it is bigger and better—and far more potent.

The New England Council was founded in 1925. It was organized to meet the challenge of the critics of doom that industry here would shrivel on the loom. Needless to say, that hasn't happened, and won't. Today a look at the membership of the council makes you think of who's who in New England. But there's nothing snooty about it. There are 2100 members, and a drive is on to double that number. Dues are modest, \$25 for an individual and \$50 for a corporation. In spite of this some subscriptions run into four figures.

But how is such an organization going to bring steel expansion to New England? They are going to do it with: (1) Careful planning, (2) painful study, (3) powerful arguments and (4) strong personalities. They are going to be aided by events outside this area such as: (1) The switch to f.o.b. mill selling, (2) proving of a vast deposit of high grade iron ore in Quebec-Labrador and (3) technological changes in steel-making.

This drive for steel in New England didn't blossom overnight. The postwar period found expanded metal using industries fighting a catch-as-catch-can procurement battle. The situation

Organization Has Powerful Data for Support of Their Arguments

• • •

By BILL PACKARD
Ass't News-Markets Editor

• • •

was aggravated by the fact that steel producers were inclined to withdraw from distant areas and concentrate on business in their own back yards in order to save the expense of freight which they were absorbing.

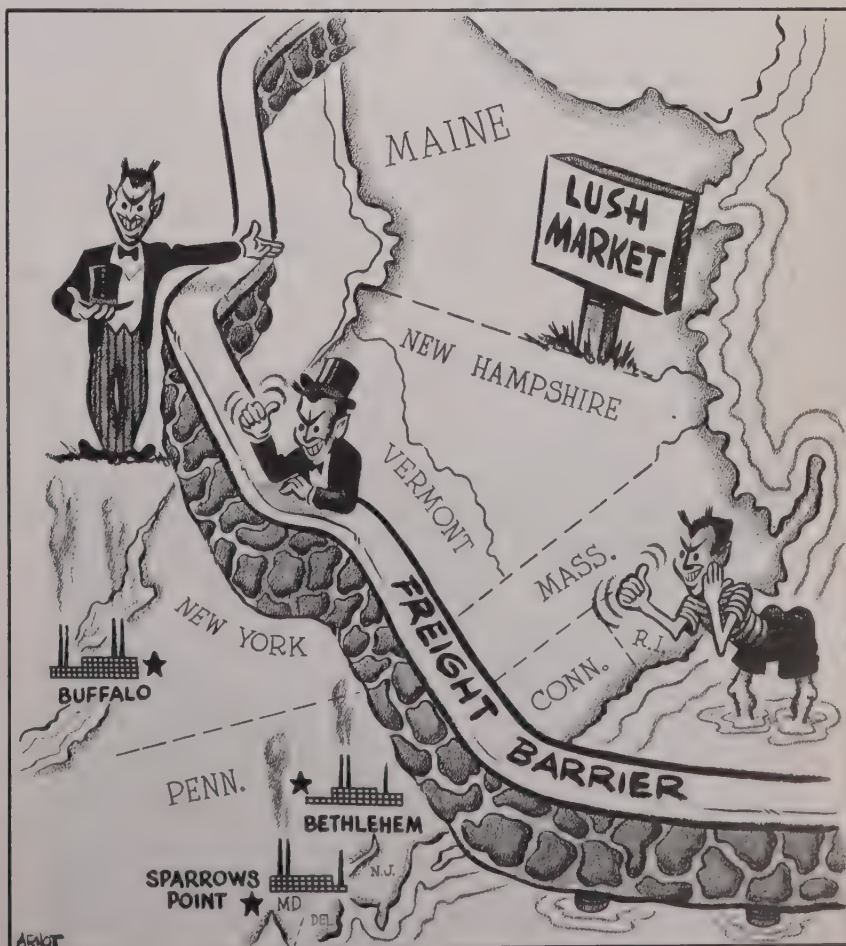
In March 1947 R. L. Bowditch, then president of the council,

urged New England as the logical location of a steel plant to be supplied from overseas mines. In September of the same year the council retained Econometric Institute, Inc., New York, to study the possibilities of establishing an integrated steel plant in New England.

The institute's study was completed in June last year. It reported that New England has the markets, the labor and the scrap to justify expansion of its existing nonintegrated steel capacity. An integrated plant was not recommended at that time. But subsequent events altered that view radically.

The decisions of the steel producers to abandon the basing

New England's Cryptography



point system of selling changed a lot of New England minds at one fell stroke. The council promptly asked the Federal Reserve Bank of Boston to make a study to determine the effects of this move on the New England economy. Boss man on this undertaking was Dr. Alfred C. Neal, vice-president and director of research of the bank.

Dr. Neal's excellent report was submitted to the council in October. The youthful bank executive reached the salient conclusion that "the New England market is now a protected market. Items produced in Pittsburgh which formerly had a Buffalo basing point will cost \$1.50-\$2.00 per ton more on shipments to central New England points.

"Items shipped from Pittsburgh which had a Bethlehem, Pa., basing point will cost \$3.50-\$5.00 per ton more. Items shipped from Pittsburgh which formerly had a Sparrow's Point basing point will cost \$2.00-\$3.00 per ton more. The freight advantage enjoyed by New England mills over these former major basing points nearby ranges from \$7.00-\$14.00 per ton."

In spite of this protected market not all are agreed that a fully integrated steel plant is the best economic answer to the problem. According to J. C. Richdale, president of the council, New England industry consumes a little more than 1.6 million tons of steel annually. She is currently producing

about one-fourth to one-third of this amount. A fully integrated mill in New England would have to sell part of its output outside the area. It would be faced with freight disadvantages, just as mills outside the area are now faced with them.

Thus has grown the idea that a smaller undertaking might be more economical. The development of continuous casting of semifinished steel, revealed by THE IRON AGE, Aug. 19, 1948, p. 72, captured the imagination of a lot of Yankee minds here. The possibilities of smaller units, smaller capital, and decentralization seemed to answer their needs. They investigated. They have been assured that the development will be ready for licensing within a year.

Historically, New England has not been regarded as an economic location for pig iron production. But the development of Quebec-Labrador ore might change all that. People here think that New England ports are the logical place for the ore to come.

Naturally they are opposed to the St. Lawrence Seaway. They say it is too expensive. They don't believe they would get any of the power from the hydro-electric development, and they point out that there is a lot of undeveloped water power in New England and Southeastern Canada.

In spite of the changing logistics which seem to favor them,

New Englanders are not very anxious to enter the pig iron business on a large scale. They would like to import the iron from South-eastern Canada. They think it would be nice if the world bank would finance construction of blast furnaces there to process the Quebec-Labrador ore. They also look longingly at the titanium smelter to be built near Sorel, Que., by Kennecott Copper Co. Pig iron will be a byproduct of this operation.

It should be emphasized that their plans are flexible. They would like to have a fully integrated plant. They would rather have just the openhearth and finishing facilities. But they are willing to talk about almost any combination of plans aimed at producing more steel here.

Probably their best weapon is the statistics which they are compiling. Center of this effort now is a newly appointed committee on iron and steel supply, headed by Frederick S. Blackall, Jr., president of the Taft - Peirce Manufacturing Co., Woonsocket, R. I. He is a former president of the council. This committee will work in close cooperation with the council's new committee on Canadian-New England relations. This group feels strong economic ties with Canada and it is doing all it can to develop them.

But these enterprising Yankees are not waiting for a steel mill to come to them. They are going to the mill. This week the council had discussions with one of the major producers. The subject was steel expansion in New England. A conference with another major producer will be held in the near future. Others are in the making. It is the purpose of the council to contact every potential builder of steel facilities in this area. It is for just such occasions that they are collecting a vast amount of statistical information. The data covers the market for all types of steel products, as well as the types and quantities of steel produced here.

Here is the type of project they will try hardest to sell: (1) Open-hearth furnaces, to be built on the tidewater, possibly to be fired with natural gas, (2) possibilities of continuous casting to be thoroughly explored, (3) pig iron to be imported from Canada, (4) any

TURBO EFFICIENCY: This new turbo blower is one of two under construction at the Pittsburgh Works of Jones & Laughlin to improve blast furnace production of pig iron. Republic Steel Corp. has already increased the efficiency of 5 of their furnaces by more than 10 pct with the installation of such blowers which increase top pressure in furnaces.



new ideas which would help assure steel for the area.

These suggested ways and means are flexible, subject to change. The one part of the plan which appears unalterable is the hungry desire of this area to assure itself of an economical supply of steel. They think this can best be done by building more facilities here. They are tired of feeling like orphans in the steel market. They believe f.o.b. mill is here to stay. To them this means high-priced steel, as long as it must be shipped in from other areas.

They believe that steel expansion on the East Coast tidewater is a natural and a necessity. They want it to be in New England.

Moves to New Offices

Burbank, Calif.

• • • The new business offices of Aerol Co., a subsidiary of Airquipment Co., are at 2820 Ontario St., in Burbank. Aerol products, however, will still be manufactured at the Los Angeles plant at 1823 East Washington Blvd.

The substantial increase in orders which greeted the announcement of the new Aerol-Seal guaranteed water-tight wheel was responsible for the pressure put upon Aerol manufacturing facilities. With the purchase of the company last month by Airquipment Co., a wholly owned subsidiary of Lockheed Aircraft Corp., adequate production facilities and access to sufficient supplies of materials has resulted in an immediate step-up in the production of Aerol materials handling equipment.

Gets \$6 Million Gift

Pittsburgh

• • • Approximately \$6 million in cash and securities has been given to the Carnegie Institute of Technology by the W. L. and May T. Mellon Foundation to establish the nation's first graduate school of industrial administration.

Carnegie president Robert E. Doherty revealed that at least \$1 million of the foundation's gift will be used to erect a building on the Tech campus and about \$5 million to endow the new school.

Threat of Nationalization Seen for Steel

Hartford

• • • Irving S. Olds, board chairman of U. S. Steel Corp. is a soft spoken and comfortable man. When it comes to defending free enterprise his voice and manner remain the same but the message takes on the characteristics of the product his company sells.

Last week he bluntly told members of the Manufacturers Assn. of Hartford County that now the time has come to tell the true story of business to the American public. That has been said before. But Mr. Olds went further. He called it a "distinct responsibility." He also suggested how it should be done.

While he was at the job of selling the steel industry to businessmen here he dragged out in the open the fear that some steel people have repeated among themselves—that a definite effort seems to be under way to eventually nationalize the steel industry.

"While that may seem to many of you a remote possibility, I should not be surprised to learn that the eventual nationalization of the steel industry along proposed British

lines is in the minds of some of our critics," he declared. "Industry should be alert to the possible firing of an opening gun in a long range program for the entry by government into what has heretofore been regarded as private business."

Mr. Olds conceded that "we must anticipate constant change in conditions all over the world" but he saw no reason why these changes should be allowed to eliminate fundamental American freedoms and principles.

Saying that there was a threat in these days of peace of a planned and controlled economy Mr. Olds argued that this could mean only a beginning on the road to socialism. To counteract such a trend he suggested industrial concerns do the following: (1) Tell the business facts of its life to its foremen and other employees. (2) Bring its story to the attention of the senators of its state and to its representative in Congress. (3) Tell the people of its own community of its own activities and achievements and of the benefits to the whole American people of the American business system.

SEPARATOR: Jones & Laughlin Steel Corp. put a new pilot plant in operation last year at the Benson Mines, N. Y. to develop new sources of iron ore. Here are shown the first of 3 stages of spiral concentration in separating nonmagnetic ore from crushed rock. Crude ore is carried down the spiral channels by wash water. Waste material is washed to the outer lip of the spiral; iron minerals toward the inner portion. Finally they are separated.



Industrial Briefs . . .

• **ISIS ELECTION**—Edward L. Solomon, Max Solomon Co., Pittsburgh, has been elected president of the Institute of Scrap Iron & Steel succeeding Herman D. Moskowitz. Stanley M. Kaplan, M. S. Kaplan Co., Chicago, was elected first vice-president; Clarence C. Cohen, I. J. Cohen & Co., Inc., Kansas City, Kan., was named second vice-president; Ralph Ablon, Luria Bros. & Co., Inc., New York, was elected secretary and Samuel G. Keywell, Samuel G. Keywell Co., Inc., Detroit, was reelected treasurer.

• **RECEIVES FELLOWSHIP**—Carnegie Institute of Technology has announced the receipt of a Postgraduate Fellowship in Metallurgy, believed to be only the second scholarship in that field ever given by the DuPont Co. to an American college or university.

• **BUILDING PLANT**—The Niagara Alkali Co. has announced the construction at Niagara Falls of a new plant for the production of trichlorethylene, a chlorinated solvent widely used in industry chiefly as a degreasing and metal cleansing agent.

• **WESTERN OUTLET**—A. Milne & Co., New York, tool steel specialists, has announced the opening of an office in Dayton at 238 Lafayette St. in charge of John I. Kitts.

• **OPENS NEW OFFICE**—The Pennsylvania Salt Mfg. Co. has announced the opening of a new district sales office in Appleton, Wis., for its Heavy Chemicals Div. C. H. Anderson has been named district sales manager.

• **DISTRIBUTOR**—G. A. Gray Co., Cincinnati, builders of metal planers, planer type milling machines and horizontal boring machines, has announced the appointment of W. E. Shipley Machinery Co., Philadelphia, as exclusive distributors for Philadelphia and Baltimore.

• **NAMES OFFICER**—The Magnesium Assn. has announced the appointment of R. B. Brown, Shrewsbury, N. J., as executive vice-president. He succeeds T. W. Atkins who resigned to enter into his own business in the banking field at Painesville, Ohio.

• **APPOINTS HEAD**—John D. Sullivan, assistant director of Battelle Institute, Columbus, Ohio, has been named chairman of a new division, the Extractive Metallurgical Div. It was organized to correlate metallurgical information on production and refining of nonferrous metals. A 3-day session of the division will be held in San Francisco, Feb. 15-17.

• **BUYS OVEN PLANT**—The Foundry Equipment Co., Cleveland, has announced the purchase of the industrial oven business of Young Bros. Co. of Detroit. Young Bros. Co. will retain its present name and will continue the sale, manufacture and installation of its ovens.

• **NEW SALES OFFICE**—Power plant control equipment division of the Swartwout Co., Cleveland, will establish a company office in Philadelphia at 1817 E. Allegheny Ave. In charge of the office are R. J. Jones and R. H. Frost.

• **GETS CONTROL**—The Sperry Corp. which since 1945 has owned 50 pct of Wright's Automatic Machinery Co., Durham, N. C., has purchased the remaining common stock. Company policy will remain unchanged.

• **FLANGE AGENT**—Ardun Co., 317 S. Detroit Ave., Tulsa, Okla., has been appointed a distributor of Tube-Turn welding fittings and flanges of Tube Turns Inc., Louisville.

To Study Tubular And Line Pipe Production

Washington

••• A special study of steel production in the field of tubular goods and line pipe indicates that, while there will be a considerable jump in production in 1949, total tonnages will still fall short of requirements of the oil and gas industries as estimated by the Interior Dept., according to Earl W. Clark, director of the Office of Industry Cooperation.

Estimated requirements for the well drilling industry for 1949 is placed at 1,840,000 tons, based on an anticipated drilling of 43,000 holes—4000 more than in 1948. Production of tubular goods is estimated by the OIC at about 1,803,000 tons.

Production of line pipe in 1949 is estimated at 2,553,500 tons (246 pct above prewar average). There is a chance, Mr. Clark said, that if nonintegrated mill production reaches capacity, the OIC estimate may be boosted to as much as 2,675,000 tons.

Output in 1948 was estimated at 2,221,000 tons. While no estimate of requirements this year was given by OIC, on the basis of Federal Power Commission figures, gas line needs alone could absorb the whole of 1949 pipe output.

Building Tin Smelter

Sewaren, N. J.

••• The tin smelter now under construction here for the Vulcan Detinning Co. is expected to be in operation by the second quarter of the year. The smelter will operate on lower grade tin concentrates than can be used by the government smelter at Texas City, Tex. Capacity is expected to be 1800 tons of fine tin a year.

Declares Dividend

Chicago

••• A. M. Castle & Co., at a regular meeting of the board of directors recently, declared the regular quarterly dividend of 50¢ per share on the capital stock outstanding of 240,000 shares. Payment is to be made Feb. 10 to stockholders of record Jan. 28, this year.

Export Licenses Granted For 859,297 Tons Steel

Washington

••• Export licenses permitting shipment of 859,297 net tons of iron and steel products were granted during the fourth quarter of 1948, according to the Office of International Trade.

Steel producers received licenses to ship the largest tonnages of sheet, strip, rails and accessories, and railway wheels and axles. Merchant exporters received licenses to ship the principal tonnages of bars, wire rod, wire, and wire products.

Most of the licenses for semi-finished steel went to foreign governments and their purchasing missions. The heaviest proportion of steel plate, structural shapes, casing, pipe, tubing, and forgings was licensed to special projects.

Surplus and reject material is not included in the tonnage figures reported by OIT.

About 432,000 tons were licensed for export through normal commercial channels, 60 pct by producers and 40 pct by merchant exporters. The remaining 50 pct of the tonnage was divided among applicants for special project licenses (39 pct), foreign governments or their missions (8 pct), and foreign subsidiaries of U. S. firms (3 pct). No licenses were issued to government agencies during the fourth quarter.

Penn. R.R. Acquires Land

Philadelphia

••• Benjamin F. Fairless, president, and Irving S. Olds, chairman, U. S. Steel Corp., were guests of honor last week at a dinner given in the Union League Club here by Martin W. Clement, president of the Pennsylvania R.R. The gathering was attended by more than 100 leaders of the city's business, industrial and civic life. A spokesman for Mr. Clement said that the dinner was purely social.

The Pennsylvania R.R. recently announced the acquisition of a tract of some 4000 acres near Morrisville, Pa., across the Delaware River from Trenton, N. J. The tract was obtained on the basis of 2-year options which permit present use for farming to continue. Spokesmen for the railroad say that the tract was ac-

quired for sale as plant sites. The Delaware River has been dredged to permit use by ocean-going vessels with a 25 ft draft as far as Trenton. Redredging is said to be required between Burlington, N. J., and Trenton.

Employees Help Save

Boston

••• Nearly a third of a million dollars was saved at the Boston Naval Shipyard through the adoption of suggestions by employees in 1948, Capt. W. McL. Hague, USN, shipyard commander, has announced. The huge savings resulted from ideas submitted by more than 2600 local men and women in the shipyard beneficial suggestion program. Employees received over \$16,000 in awards.

Expands Midwest Sales

Oakland, Calif.

••• Expansion of the Kaiser Aluminum sales organization in the Midwest has been announced by Charles S. French, central divisional manager for Permanente Products Co. Three district sales offices have been established to handle sales in eleven midwestern and southern states.

C. S. Barnum is sales manager

of the Detroit district, covering the state of Michigan. Robert F. Black, recently transferred from Permanente's Houston office, heads the Cleveland sales office, handling accounts in northern Ohio. Thomas A. Johnson, recently promoted to the position of Cincinnati district manager, supervises sales in southern Ohio, West Virginia, Tennessee, western North Carolina, South Carolina, Mississippi, Alabama, Georgia and Florida. A branch sales office in Atlanta is attached to the Cincinnati office.

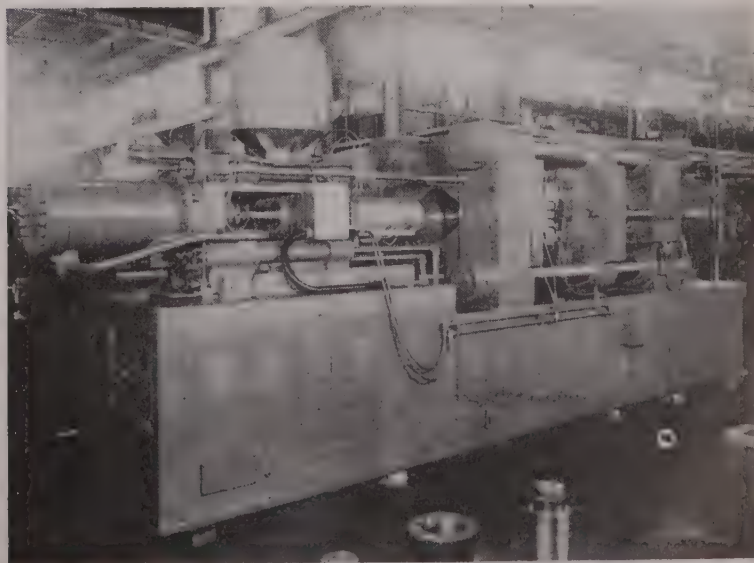
Approves Aircraft Funds

Washington

••• A total of \$109 million has been approved by the President for the purchase of approximately 158 jet fighter aircraft and a number of trainers. This money becomes available by the reallocation of funds previously earmarked for the purchase of aircraft for which present requirements are less urgent.

The new aircraft certificated are approximately 48 Northrop F-89 all-weather jet fighters, 110 Lockheed F-94 all-weather jet fighters converted from the TF-80C, and a number of the trainers, whose type has not been determined.

INJECTION MOLDING: Weighing 85,000 lb this 40 ounce, 1000 ton clamp horizontal injection molding machine was built recently by Watson-Stillman Co., Roselle, N. J. for Nash-Kelvinator. Maximum die size is 30 x 50 in. Overall height of the machine is 8 ft, 4 in. The molded meat trays for refrigerators are typical products being made in this machine. Shown in the illustration is a rear view looking toward the clamping end.



Record Crowd Discusses Prices and

Scrap Men See Tough Market Ahead, with Changes In Agreements, Sources



DEAL: Joel Claster, executive vice-president, Luria Bros. & Co., Philadelphia talks business with Chester Tuschman (center), Steel Baling Co., E. St. Louis and Frank G. Tuschman, Tuschman Steel Co., Toledo, at annual scrap meet.

Cincinnati

• • • Prospect of the toughest scrap market in 10 years brought a record crowd of dealers and brokers to the 21st annual convention of the Institute of Scrap Iron & Steel at the Netherland Plaza Hotel here Jan. 16-18. In the halls and in the private rooms talk centered on prices and prospects for 1949. "In the super-private rooms—behind the private rooms—there were more deals cooking than any one has heard of in years."

Many were fearful the market was headed lower, a few thought it would hold steady for a while, some thought some prices might bounce back a bit. A tabulation of the opinions of the 1200 scrap men who attended the convention would be all over the lot. And it would be about as valuable as a *Literary Digest* poll. The only thing most people were sure of was that prices wouldn't go sideways. A few weren't even sure of that.

The trade realized that there was going to be a lot more emphasis on quality this year—quality designed to lift the steel yield per ton of scrap charged and quality

tied in with price. Some figured too that they'd have to put more emphasis on safety in the yards and on more equipment for separation, preparation and handling.

In the private rooms there were lots of deals on the fire. Because of the current apathy of buyers some of these deals may do a slow burn. Brightest ray of sunshine for these new tieups was the possibility of a decline in the amount of scrap shipped directly by steel customers to their supplying mills. The hope stemmed from the fact that at least two mills have already released customers from the scrap return requirement.

But some of the biggest buyers are either mum on the scrap-return deal or have definitely said they have no intention of cancelling the earmarking requirement at this time. Industrial scrap quality runs too high to be lightly passed over. This leaves a healthy tonnage of scrap bypassing the dealer's domain. And he doesn't like it. This year scrap men will put on a lot of pressure to try to break up the practice. Herman D. Moskowitz, retiring president came out strongly against direct dealing even though "it is glorified under the high sounding name, 'earmarking.'"

Business prospects for 1949 were the major concern of all. Thomas W. Lippert, directing editor, THE IRON AGE, had an attentive audience as he outlined his views on business prospects for the year. The year closed, he said, with more signs of business weakness than there were at any time since pre-war days. But there were some optimistic notes too, he added. He didn't see anything like 1929 or 1921 ahead this year but it seemed obvious, he concluded, that business in 1949 would not be as good as it was last year. He predicted that if unemployment should hit the 4 million mark there would be a powerful demand for public works to take up the slack.

That scrap men will have to scratch harder for a dollar this year was clear to everyone. The market is going to be different than it has been in years—perhaps it won't resemble anything anyone has ever seen before. It was this attitude, rather than the pessimism many dealers outwardly professed, that guided a lot of the members' actions at the convention. It appears there'll be a number of changes in the dealer-broker agreements.

If steel demand holds up as many steelmakers believe it will there'll be plenty of business for the scrap industry in 1949. But the pattern is changing. Not only will there be new emphasis on quality and price but some scrap sources are changing. Max Miller, scrap consultant to the Dept. of Commerce, pointed out that the new heavy-scrap drive was essential to building up a strategic reserve of scrap in inventory. Sales of government-surplus material, including shipbreaking activities, are dwindling, Mr. Miller said. This source must be replaced by industrial scrap and foreign scrap. Observers doubted that foreign scrap would loom as large as the optimists were predicting last year.

Guesses, assurances or promises

Denies Scrap

Coatesville, Pa.

• • • Reports of heavy cancellations of contracts for shipment of German scrap to the U. S. as a result of the drop in domestic prices are not borne out by the facts, according to Robert W. Wolcott, chairman of the combined committee on foreign scrap.

Mr. Wolcott said the nation's steel industry would need all the scrap it

Quality at Scrap Convention

By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

that steel demand will be relatively high this year does not solve the dealers' immediate problem how much to pay for scrap right now. Possibility of wide price fluctuations forces them to figure on prices going a lot lower if they drop their buying price too much supply will fall off. If they are unwilling to risk building up inventory when major scrap consumers are out of the market it means cutting back their working forces.

Many dealers felt that they were behind the eight ball and would stay there until prices are stabilized. They reasoned that if mills stay out of the market for very long they'll have to lay off yard crews. When the mills come back for substantial shipments new crews will have to be hired and trained. It would mean a long wait between the time scrap is ordered and the day it begins moving to the mills.

How long last week's dead market would continue was a big question only the buyers could answer. They were there but they weren't talking.

Leo F. Reinartz, general manager, Middletown Div., Armco Steel Corp., told the convention what the steel industry expected of the scrap people this year. He did it in a nice way but he didn't

spare the gory details. He asked for better physical and better metallurgical quality in scrap shipped to the mills.

Better physical quality would mean more steel, he said. By reducing the size of heavy melting scrap it could be charged more quickly and save 15 to 20 min per openhearth heat. That time saving would boost steelmaking ability by 2 million tons in 1949, he estimated.

Mr. Reinartz then listed the type of foreign material that caused trouble in the melting furnace. He was particularly concerned about tin; stressed the fact that tin cannot be burned off cans and that if not caught it goes through the bottom of the furnace. He allowed that scrap management were often not at fault where material was improperly prepared, suggested paying higher wages or using a bonus system to assure better preparation in the yards. Scrap men privately wondered if they would be able to get more money for this work. They realized of course that in a buyers' market mills are in a better position to reject on quality grounds.

Whiting Williams, Cleveland writer and consultant, urged the institute members to check "human" procedures. Workers will be more efficient if they know their job and its relation to the whole; if their self respect can be increased. Mr. Williams who has been a laborer for many years says the worker wants to believe in himself—on the job.

William G. Marks, safety engineer, U. S. Dept. of Labor, reminded yard operators that their average safety record was not as good as might be expected. He sounded the keynote of a safety drive which the Scrap Institute will soon launch with help from



PRESIDENTS: Edward L. Solomon (left), Max Solomon Co., Pittsburgh, president-elect, shakes hands with retiring president, Herman D. Moscowitz, Schiavone-Bonomo Corp., Jersey City, at annual scrap convention.

the Bureau of Labor Standards of the Dept. of Labor. Similar programs, Mr. Marks said, had without exception reduced accidents in other lines by from 10 to 40 pct.

Scrap yard operators have long known their accident rates were higher than they should be—they have high insurance rates to prove it. But despite the fact that their operations are naturally more hazardous than those of many other industries they appear determined to better their past performance. A closer margin between costs and profits will be a powerful stimulant in 1949.

Vice-president (then vice-president elect) Alben W. Barkley, was the principal dinner speaker. He explained how government and business were becoming more and more closely bound together. The words were those of a spokesman of an administration supposedly elected with a powerful pro-labor mandate. But to the surprise of many listeners they had no tinge of business-baiting, no threats, just an appeal for cooperation.

Cancellations

could possibly get. He restated the hope that a million tons of foreign scrap could be obtained this year principally from Germany. He said that not more than 25,000 tons of foreign scrap had been cancelled.

A similar denial was reported by Republic Steel Corp. which has contracted for a considerable tonnage of German scrap. That company reported that it is extremely anxious to receive this scrap.

Name Prize Winners For Magazine Story Contest

New York

•••The Industrial Furnace Manufacturers Assn. has announced the selection of the three winning articles from the 105 articles published in 15 magazines and entered in their Prize Contest during the year ending Sept. 30, 1948.

The winner of the first prize of \$1000 is Floyd J. Kamin of Kamin Die Casting & Manufacturing Co., Chicago, for his article "Two-Chamber Induction Melting Furnace Lowers Aluminum Die Casting Cost" in the September 1948 issue of *Materials & Methods*.

The second prize of \$300 went to Thomas A. Frischman, chief metallurgist, Axle Div., Eaton Mfg. Co., Cleveland, for his article "Continuous Carburizing and Hardening of Piston Pins at the Ford Rouge Plant" in the October 1947 issue of *Industrial Heating*.

The third prize winner of \$200 is I. Stanley Wishoski of National Industrial Publishing Co., Pittsburgh, for his article "Continuous Carburizing and Hardening of Piston Pins at the Ford Rouge Plant" in the October 1947 issue of *Industrial Heating*.

Gray Iron Founders In Big Membership Drive

Cleveland

•••An industry-wide membership drive was launched Jan. 3 by Gray Iron Founders' Society, according to an announcement by R. L. Collier, executive vice president of the society. During January every non-member will be personally contacted and invited to affiliate with the national group.

A membership booklet describing the benefits of the society has been developed for the campaign and will be distributed to all non-member foundries in the United States. Donald H. Workman, the society's promotion manager, will coordinate the campaign from headquarters here.

Chairman of the membership committees of the organization's Local Management Groups will direct non-member solicitation at the local level.

Herman P. Good, Textile Machine Works, president of the society, expects the drive to enlist

the memberships of all progressive gray iron foundries which are desirous of assisting in the society's long-range program of development and improvement.

Bids Close Mar. 14 On Marshall Islands' Scrap

Washington

•••Closing date for bids on about 94,000 tons of unprepared scrap located in the Marshall Islands has been fixed at 5 p.m., Mar. 14, by the Office of the Foreign Liquidation Commissioner.

Two inspection tours are being set up by OFLC. Prospective buyers from east of the Marshall Islands will be able to leave Honolulu for Kwajalein on or about Feb. 10, returning on or about Feb. 16. Prospective buyers from west of the Marshalls will be able to leave Guam for the scrap areas on or about Feb. 20, returning about Feb. 26.

OFLC says that none of the scrap is in prepared form. Buyers will have to arrange for processing and for shipping. The successful bidders will be required to warrant that all scrap must be shipped to the United States as scrap for use in the domestic economy.

All sales will be on an as-is, where-is basis and removals must be made by the purchaser. OFLC makes no guarantee or warranty, other than to title, and consequently urges that inspection be made prior to submission of bids.

Details of the scrap items available may be obtained from Major General Clyde L. Hyssong, Foreign Liquidation Commissioner, Room 1720, Temporary "R" Bldg., Washington 25, D. C.

Decision Forbids Closed Shops in Captive Mines

Washington

•••In a decision handed down last week, an NLRB trial examiner ruled it illegal for the UMW to insist on the union shop provision of its contract with 18 captive mines.

Furthermore, the examiner's ruling recommended, the UMW must cease and desist from "directing, instigating or encouraging" strike action for the purpose of forcing the steel companies to

sign a contract which makes membership in the UMW a condition of employment.

In effect, other provisions of the ruling make illegal any demands by the union that the company refuse to hire or fire non-members of the UMW.

The ruling by the examiner assumes full force and effect in 20 days after its issuance on Jan. 19 and is enforceable in the courts unless exception is taken within the 20-day period.

Trial Examiner William R. Ringer based his decision on the finding that a majority of the captive workers covered by the present contract had not approved the union shop clause through a government-conducted election.

Moreover, he found, such an election has not been and cannot

Handy Reference

New York

•••Many IRON AGE readers have expressed an interest in acquiring military contracts. At the same time, some of them have pointed out that they don't know who buys what they have to sell. THE IRON AGE has endeavored to answer their questions. Here is an index for handy reference showing military purchasing responsibility for selected items. It was made available by the Munitions Board.

be called until the union and its officers file full data required under the Taft-Hartley Act—and have filed non-Communist affidavits.

The current contract, due to expire on June 30, was signed last July after injunction proceedings had been taken to stop the strike. Both union and the companies agreed that the union shop clause would be subject to final decision in the case just decided.

Making Foul Detector

Buffalo

•••American Machine & Foundry Co. has started production at its Cheektowaga plant of a new foul detector for bowling alleys. Expected to replace many of the foul judges required in competition, the new "radar" uses a single-beam electric eye to detect the fouls.

INDEX OF MILITARY PURCHASING OFFICES — A GUIDE TO MILITARY PURCHASE RESPONSIBILITY FOR SELECTED ITEMS



To sell to the Army, Navy, or Air Force any of the products listed below, get in touch with the Military Purchasing Office cross-indexed to the item you have for sale. This list of products, and the purchasing offices that buy them, is compiled as of 1 January 1949. The list does not include

all items bought for military use; it will be enlarged from time to time as the responsibility for purchasing other items is assigned to specific procurement offices. To find a military buyer for items not now included in this list, write to Logistics Division, Department of the Army, Washington 25,

D. C.; Office of Naval Material, Department of the Navy, Washington 25, D. C., and Procurement Division, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio.

AIRCRAFT PARTS AND EQUIPMENT

Item	Key to Purchasing Offices
Aircraft engines, propellers, and frames	AF-1, N-1, and N-7
Lifeboats, rigid, air-borne	AF-1

CAMERAS, FILM AND PHOTOGRAPHIC EQUIPMENT

Motion- and still-picture equipment and sensitized materials	AF-1
Photographic chemical preparations	AF-1
Photographic processing and finishing equipment and supplies	AF-1
X-ray film, medical	J-2

CUTLERY AND HAND TOOLS, INCLUDING FOOD-HANDLING EQUIPMENT

Cutlery, food processing (Including butchers, cannery, fishery, and bakery)	A-6
Cutlery, industrial (Including shoe, rubber, linoleum, woodcarvers, and paper hangers)	N-8
Edge tools, files, rasps, and saws	N-8
Hand tools	N-8
Kitchen utensils, tools, and cutlery and tableware (Except silverware)	A-6
Mechanics' measuring tools	N-8

CONSTRUCTION, MINING, AND EXCAVATING EQUIPMENT

Item	Key to Purchasing Offices
Construction; mining and excavating equipment (Mining machinery, rock-drilling and earth boring; power excavators, wheel-mounted; dredging equipment; scrapers; tractors, contractors; loaders; crawler carts)	A-1
Contractors' jacks (For supporting trench sidewalls, concrete forms, and related uses)	N-8 and N-9
Graders and maintainers	N-8 and N-9
Logging equipment	A-1
Oil field producing equipment	N-8
Power excavators and attachments (Track laying only)	N-8 and N-9
Road-making machinery: Bituminous mixing, paving and related equipment	A-1
Concrete mixing, paving, placing, and related equipment, including cement handling and placing equipment	N-8 and N-9
Road and pavement clearing and cleaning equipment, except tractor and truck attachments	N-8 and N-9
Road and pavement repair, marking, leveling, and demolition equipment	A-1
Scaffolding, adjustable and demountable	A-1
Stabilizing, compacting, and soil-preparation equipment for roads and streets, except tractor and truck attachments	A-1
Wood materials, crude and fabricated (Lumber)	A-2 and A-3

GUNS, ROCKETS, AMMUNITION, AND ORDNANCE EQUIPMENT

Item	Key to Purchasing Offices
Antiaircraft carriages, mounts, and recoils	A-8
Artillery carriages, mounts and recoils	A-9
Artillery carriages, mounts, recoils, and transport wagons for 8-inch gun and 240 mm. howitzer only	A-8
Artillery shells and projectiles	A-10 and N-5
Bayonets	A-11
Bombs, fin assemblies, and subassemblies	A-12 and N-5
Cartridge clips	A-11
Demolition and shaped charges	A-12
Fire control equipment (Except range indicator and binocular Navy)	A-10
Fuzes, mechanical, time, and V. T.	A-10, A-12 and N-5
Guns, howitzers, mortars, and rifles; 20 mm. and above	A-13
Hand carts	A-9
High explosives, propellants, blasting agents, supplies, and miscellaneous explosives	N-5
Launcher, grenade	A-11
Launcher, rocket 2.36 and 3.5	A-9
Links, metallic belt—Cal. .30, .50, .60	A-9
Machine guns, .30 to .50 cal., except air; also .60 cal.; machine gun trainers, mounts, and tripods	A-9
Machine guns, .30 to .50 cal. air	A-11
Military tanks, armored cars, self-propelled artillery and other armored combat vehicles	A-14
Mines, naval and aerial, and components	N-5
Navy machine gun mounts for boats	N-4
Pyro powder	N-5
Rockets, mines, signals, grenades, and components	A-12 and N-5
Scabbards	A-9
Small arms ammunition	A-10
Small arms (rifles, carbines, submachine guns, pistols, revolvers, and shotguns)	A-11

MOTOR VEHICLES, INCLUDING AMPHIBIOUS LANDING CRAFT (See also RAILROAD ROLLING STOCK, MAINTENANCE PARTS, AND EQUIPMENT)

Item	Key to Purchasing Offices
Amphibious military motor vehicles (Except landing vehicles tracked)	A-14
Landing vehicles tracked	N-3
Passenger carrying vehicles, trucks	A-14
Tractors: Earth moving, mining, agriculture (Excludes materials handling)	A-1

PETROLEUM, OILS, AND LUBRICANTS

Crudes, petroleum and mineral	J-1
Fuel, mineral, and shale oil	J-1
Gasoline and components	J-1
Lubricants, including gear lubricants, greases, oils, and oil base stocks	J-1
Naphtha solvents	J-1
Petroleum gases	J-1
Petroleum products, including waxes, petrolatum, and related items	J-1

RAILROAD ROLLING STOCK, MAINTENANCE PARTS, AND EQUIPMENT (See also MOTOR VEHICLES, INCLUDING AMPHIBIOUS LANDING CRAFT AND TRACTORS)

Locomotive cranes and derricks	N-6
Railroad construction and maintenance equipment—Power driven	A-1
Railroad transportation equipment; except items of special design or peculiar to a particular department	A-5
Rolled wheels, axles, track accessories (wrought steel wheels, wheel centers, axles, and tires)	A-4

WATCHES, CLOCKS, AND PARTS

Item	Key to Purchasing Offices
Chronometers	N-7
Clocks, spring and electric, including movements and parts	N-7
Watches, complete (Including stop watches, watch parts, and movements)	A-10

FOOD AND FOOD PRODUCTS, INCLUDING BEVERAGES

Animal oils and fats	A-6 and A-7
Baking powder, yeast and other prepared leavening agents	A-6 and A-7
Beverages	A-6 and A-7
Butter and margarine	A-7
Flour and related products	A-6
Food products, perishable	A-7
Food products, non-perishable	A-6
Sugar and molasses	A-6

MISCELLANEOUS

Agricultural machinery and implements, including tractors	A-1
Coal	N-2
Coke	N-2
Combat ships and landing vessels	N-3
Domestic water systems (Power operated units) shallow and deep well	N-8 and N-9
General purpose industrial machinery for crushing, pulverizing, screening, and mixing	N-8
Lifeboats, ship-borne	A-4
Medical supplies	J-2
Saw mills (Complete units)	A-1
Sporting and athletic goods	A-6

PURCHASING OFFICES

Key	ARMY
A-1	Chicago Procurement Office, Corps of Engineers, 226 West Jackson Boulevard, Chicago 6, Ill.
A-2	Atlanta Lumber Branch Office, Corps of Engineers, P. O. Box 1889, Atlanta 1, Ga.
A-3	Portland Lumber Branch Office, Corps of Engineers, 628 Pittcock Block, Portland 5, Oreg.
A-4	Procurement Division, Marietta Transportation Corps Depot, Marietta, Pa.
A-5	Chief, Supply and Facilities Division, Office, Chief of Transportation Washington 25, D. C.
A-6	Chicago Quartermaster, Purchasing Office, 1819 West Pershing Road, Chicago 9, Ill.
A-7	Headquarters Quartermaster Market Center, 226 West Jackson Boulevard, Chicago 6, Ill.
A-8	Watertown Arsenal, Watertown 72, Mass.
A-9	Rock Island Arsenal, Rock Island, Ill.
A-10	Frankford Arsenal, Philadelphia 37, Pa.
A-11	Springfield Armory, Springfield 1, Mass.
A-12	Picatinny Arsenal, Dover, N. J.
A-13	Watervliet Arsenal, Watervliet, N. Y.
A-14	Detroit Ordnance District, 6301 West Jefferson Avenue, Fort Wayne, Detroit 17, Mich.

JOINT

(Army-Navy and Air Force)

J-1 Armed Services Petroleum Purchasing Agency,
Tempo 4 Building, Room 11005,
Washington 25, D. C.

J-2 Armed Services Medical Procurement Agency,
84 Sands Street,
Brooklyn 1, N. Y.

NAVY

N-1 Bureau of Aeronautics,
Navy Department,
18th Street and Constitution Avenue,
Washington 25, D. C.

N-2 Bureau of Supplies and Accounts,
Fuel Division, Navy Department,
Arlington Annex,
Washington 25, D. C.

N-3 Bureau of Ships, Navy Department,
18th Street and Constitution Avenue,
Washington 25, D. C.

N-4 Pr. 5, Bureau of Ordnance,
Navy Department,
18th Street and Constitution Avenue,
Washington 25, D. C.

N-5 Pr. 6, Bureau of Ordnance,
Navy Department,
18th Street and Constitution Avenue,
Washington 25, D. C.

N-6 Bureau of Yards and Docks Annex,
Navy Department,
Washington 25, D. C.

N-7 Naval Aviation Supply Office,
Oxford Avenue and Martins Mill
Road,
Philadelphia 11, Pa.

N-8 Navy Purchasing Office,
Navy Department,
18th Street and Constitution Avenue,
Washington 25, D. C.

N-9 Navy Purchasing Office,
1206 South Santee Street,
Los Angeles 15, Calif.

AIR-FORCE

AF-1 Procurement Division,
Air Materiel Command,
Wright-Patterson Air Force Base
Dayton, Ohio

¹ In addition to the subsistence items (food, food products and beverages) bought by the Department of the Army (A-7), various subsistence items are, by arrangement, purchased by the Navy.
The following is a list of the principal Navy installations which purchase nonperishable subsistence items that either are not on the Army ration or are not required in large quantities: Naval Shipyard, Boston 29, Mass.; Naval Shipyard, Charleston, S. C.; Navy Purchasing Office, 844 North Rush Street, Chicago, Ill.; Naval Air Station, Corpus Christi, Tex.; Naval Air Station,

Jacksonville, Fla.; Navy Purchasing Office, 1206 South Santee Street, Los Angeles, Calif.; Naval Air Station, Miami, Fla.; Naval Station, Algiers, New Orleans, La.; Navy Purchasing Office, 111 East 16th Street, New York, N. Y.; Naval Supply Depot, Newport, R. I.; Naval Supply Center, Norfolk, Va.; Naval Air Training Base, Pensacola, Fla.; Naval Shipyard, Philadelphia, Pa.; Navy Purchasing Office, San Francisco, Calif.; Naval Supply Depot, Seattle, Wash.; and Naval Gun Factory, Washington 25, D. C.
The following is a list of the principal Navy installations which purchase perishable sub-

sistence items that either are for the convenience of ships visiting in coastal areas or are not required in large quantities: United States Naval Academy, Annapolis, Md.; Navy Purchasing Office, 844 North Rush Street, Chicago, Ill.; Navy Purchasing Office, San Francisco, Calif.; Naval Gun Factory, Washington, D. C.; Navy Purchasing Office, Los Angeles, Calif.; Submarine Base, New London, Conn.; Navy Purchasing Office, New York, N. Y.; Naval Supply Depot, Seattle, Wash.; Naval Shipyard, Portsmouth, N. H.; Naval Shipyard, Philadelphia, Pa.; Naval Air Station, Jacksonville, Fla.; Naval Air Station, Miami, Fla.; Naval Shipyard, Boston, Mass.



Acme Steel Operating New Strip Mill With Capacity of 5000 Tons

Chicago

••• Acme Steel Co.'s new ultra-modern strip mill is now in full operation at the Riverdale, Ill., plant. Construction was started in November 1946. The mill turned over for the first time in early November last year. Delays due to difficulty in getting delivery of electrical apparatus held up completion of the installation for months.

The mill is a five stand, four high, 14 x 33 x 22 in. high speed unit. It will cold roll strip from 8 to 18¼ in. wide in gages 0.006 to 0.020 in. The maximum coil weight is 8000 lb. United Engineering & Foundry Co. built the mill and electrical equipment was furnished by General Electric and Westinghouse. The maximum capacity of the mill, figuring 15 turns a week, was estimated to THE IRON AGE to be between 4000 to 6000 tons a month, depending on gage.

All told, the whole installation cost Acme \$2½ million. Each of the five stands is driven by a 1250 hp motor with the coiler driven by 300 hp motor. At the delivery end of the mill the strip, which can reach a top speed of 3000 fpm, is measured by a flying, Pratt & Whitney micrometer. The thickness can be held to ± 0.002 by this electronic instrument. Very little crown has been experienced with the product rolled so far. The strip is practically the same thickness across its entire width.

Throughout, the installation is the latest and most modern that can be found anywhere. The motor room is a show place complete with "Rototrols" for synchronous speed variation of the five mill motors. Adjacent to the motor room is the precipitron. This equipment, completely devoid of any moving parts, removes dirt and dust from 60,000 cu ft of air per minute. The precipitron alone cost Acme \$50,000, but they believe that this unit, which ventilates and cools the large generators and mill drive motors, will pay for itself before long.

C. S. Traer, chairman of the board of Acme Steel, has spent more time lately at the new mill

than he has in his office. This is not because of troubles on the mill, but rather because he likes operations and the new mill is Acme's answer to the customers who have been yelling for more product for the past 2 years. Mr. Traer told IRON AGE that the new mill has lived up to all expectations. Eventually he believes all Acme's products will be cold-rolled and that the sale of hot-rolled strip will have to be discontinued.

The company has been developing new products which require cold-rolled stock. The new cold mill will need more of Acme's hot-rolled band production than was formerly used. Also, larger mills, not as specialized as is Acme, can more profitably sell plain hot-rolled strip.

Mill operators told IRON AGE that the only bug in the new mill is the work rolls. They reported that they still experience spalling of these hardened rolls. The rest of the equipment they say is relatively trouble free and vastly improved over older mills. Of note on the mill itself are the hydraulic tensiometers. These rolls on the exit sides of each of the first four stands take up the slack between each set of rolls or stands. Tensiometer controls are tied in electrically with mill speeds, percent reduction, gage and all other vari-

ables in the process. Tension on each stand can also be adjusted by manual electrical controls while mill is rolling.

Spectroscopists to Meet

Pittsburgh

••• The Spectroscopy Society of Pittsburgh has announced that they are sponsoring the Ninth Pittsburgh Conference on Applied Spectroscopy on Feb. 18 and 19 at the Mellon Institute Auditorium in Pittsburgh.

The chairman for absorption spectroscopy papers is Joseph Liebhich, Mellon Institute, and for emission spectroscopy papers Joseph Geffner, Weirton, W. Va.

Accepting Wire Licenses

Washington

••• License applications covering proposed exports of wire and wire cable (except insulated) against first and second 1949 quotas may be submitted at any time, under an amendment to Current Export Bulletin 499 which lists specific dates for filing applications.

At the same time, similar restrictions covering carbon and alloy (stainless included) steel forgings n.e.s. were also lifted for the first half 1949.

TOUGH SKINNED: Workmen are shown using a small overhead crane to remove a container of shafts from one of the Leeds & Northrup carburizing furnaces in the heat treating department of the Caterpillar plant at Peoria, Ill.



Lone Star Steel Co. Asks RFC Loan; Plans To Make Finished Oil Equipment

By D. I. BROWN
Chicago Regional Editor

Dallas

• • • On Jan. 18, Lone Star Steel Co. made application to the Reconstruction Finance Corp. for a loan of \$65 million, which they will use to get into the steel business. The application was filed with L. B. Glidden, RFC manager for the Dallas region.

Lone Star Steel Co. now owns and operates the war-built blast furnace and byproduct coke plant at Lone Star in northeast Texas. They obtain their ore from the nearby ore deposits which contain an excess of 30,000 acres of high-grade iron ore, and their coal comes from Oklahoma.

The proposed new steel mill will be the first of its kind in the Southwest. Present plans call for the production initially of finished oil country goods. George F. Ramsey, general manager of Lone Star Steel, told THE IRON AGE that as yet they haven't decided whether they are going to make welded or seamless pipe. Thus the type of finishing mills to be built is still subject to question. However, the plans are settled for four 150-ton openhearth with a sufficient number of soaking pits to handle the ingot output of this plant.

Lone Star officials have given

serious consideration to a continuous casting process, but this will not be part of the original installation for two reasons: (1) When spending government money, companies are obligated to install conventional equipment. (2) So far, the maximum cross-section that can be successfully continuous cast is somewhat limited.

Lone Star believes that the market possibilities in this area for oil product goods are excellent. The company's natural market area in-

cludes Texas, New Mexico, Oklahoma, Kansas, Arkansas and Louisiana. Within this area are located 70 pct of the nation's crude oil production; 75 pct of the nation's proven oil reserves, and 88 pct of the proven natural gas reserve. At present, the major producers for the production of oil country goods are in the Pittsburgh and Chicago areas with the exception of the new Republic mill at Gadsden, Ala.

Lone Star officials told THE IRON AGE it will take from 18 months to 2 years to complete the additional steelmaking facilities. When completed, total employment it is believed will be around 2600 compared to the present employment of 1100.

Small Business Could Get More of Airforce Procurement Contracts

Washington

• • • More business in Air Force procurement contracts is available and will go to small business establishments if they will go after it, it is indicated by the Defense Dept.

In a report of the Air Material Command headquarters, it is revealed that small businesses (500 employees or less) are currently getting approximately half the contracts awarded although their dollar volume is a relatively small percentage of the whole.

For the period of May 19 through November 1948, small businesses received 1969 contracts out of 4016 granted by the Air Forces. Out of the \$1.4 billion worth of business, however, the

small contractors got \$28 million.

Purchasing officers believe that many of the smaller firms are losing out because they do not know how to go after the business. In reality, all that is necessary, they say, is to get placed on the bidder register.

This is done by sending such a request to the Commanding General, AMC, Wright-Patterson Air Base, Dayton, Ohio. A form will be sent back to be filled out and returned. It is as simple as that, procurement officers say. Whenever bids are to be let on goods covered in the application, the firm will be notified.

Contract officers are available at seven field offices to help potential bidders when such contracts are advertised. These offices are located in New York City, Boston, Detroit, Chicago, Los Angeles, Fort Worth, and Dayton.

AMERICAN IRON AND STEEL INSTITUTE			Blast Furnace Capacity and Production—Net Tons						AUGUST - 1948			
	Number of companies	Annual blast furnace capacity	PRODUCTION									
			PIG IRON		FERRO MANGANESE AND SPIEGEL		TOTAL					
			Current month	Year to date	Current Month	Year to date	Current month	Year to date	Percent of capacity			
									Current month	Year to date		
DISTRIBUTION BY DISTRICTS:												
Eastern.....	11	13,093,560	988,676	7,163,839	32,474	229,699	1,021,150	7,393,538	92.0	84.7		
Pittsburgh-Youngstown.....	17	25,588,120	2,068,259	15,191,829	13,068	162,957	2,081,327	15,354,786	96.0	90.0		
Cleveland-Detroit.....	6	6,495,000	521,352	3,899,345	-	-	521,352	3,899,345	94.7	90.0		
Chicago.....	7	14,700,290	1,088,394	8,009,707	-	10,190	1,088,394	8,019,897	87.4	81.8		
Southern.....	8	4,949,660	374,204	2,907,646	4,866	60,968	379,070	2,968,614	90.4	89.9		
Western.....	3	2,612,300	163,319	1,479,905	-	-	163,319	1,479,905	73.8	85.0		
TOTAL.....	35	67,438,930	5,204,204	38,652,271	50,408	463,814	5,254,612	39,116,085	92.0	87.0		

Foreign Aid Allotments Waiting for More Funds

Washington

• • • With foreign aid allocations slowed down until Congress grants new appropriations, most ECA authorizations are centering around industrial goods and materials. But at that, only about \$15 million worth of new orders for industrial goods were approved during the first half of January.

Nearly all appropriations have been allocated and most new approvals come from adjustment of previous authorizations. As of Jan. 15, the cumulative totals for all ECA countries amounted to \$4.4 billion.

Machine tools, construction and mining machinery, and tractors dominate current approvals. Over the 2-week period, approvals included \$3,550,000 worth of machine tools, \$2,465,000 worth of construction and mining machinery and equipment, and \$4,135,000 worth of tractors. Steel and non-ferrous metals accounted for \$2,145,000. These figures include only authorizations for American purchases.

A lump authorization sets aside nearly \$2 million worth of industrial goods for Greece. More than half was centered on motor vehicles and parts.

A majority of the machine tool purchases authorized since Jan. 1 have been for Austria, which has been allocated \$2.5 million worth.

The Netherlands accounts for most of the tractor orders, \$3,782,000 worth of agricultural types. At the same time, Greek farmers were allocated 5000 mules.

Most ECA Aid Allocated Was By Direct Grants

Washington

• • • A considerable portion of European aid commodities is scheduled for delivery during the first half 1949 but nearly all of the funds authorized for aid during the first 15 months of the program had been allocated by the Economic Cooperation Administration through Dec. 31.

As of that date, \$4.9 billion had been tied up in procurement authorization, loans and reimbursements.

Year-end recapitulation by the ECA shows that a major portion of the first appropriation was allocated in direct grants—nearly \$3.4 billion. Another \$952 million was set aside as loans and \$582 million was parceled out in conditional allotments.

Britain received the lion's share

of \$1.3 billion in help, including \$313 million in loans. France was second largest recipient, some \$1 billion, including loans of \$172 million.

Italy held third place with \$571 million and Germany ranked fourth with \$508 million, most of which was allocated to Bizone.

Video and Public Relations

Milwaukee

• • • One of industry's troubles in trying to reach the public has been the lack of the personal factor. Milwaukee's industries have suddenly found the solution—television. They didn't hatch the idea, but they are taking advantage of it every Wednesday night for a full 30 min. on WTMJ's "Salute to Industry." The program is sponsored by the Marine National Exchange Bank of this city.

George P. Blakney, vice-president of the bank, who forked out \$8000 for 26 consecutive shows thought he might be taking a gamble. However, when he started to offer the televised time to industry he soon changed his mind. Right now he is besieged with requests from different industries all over the state.

Allen-Bradley Co., makers of electrical switchgear, led off on Oct. 27. Allis-Chalmers Mfg. Co. took two consecutive programs to tell their story. Traction Co., another local firm, has televised its story. A. O. Smith Corp. introduced eight old time employees to the video audience. Their products and manufacturing processes were shown via movies and Milwaukeeans are fast beginning to intimately know all about their local industries.

GE X-ray Corp. is scheduled to show an x-ray movie, plus the usual presentation late in January. Evinrude and others are coming up. Cramer-Krasselt Co.'s television department, who incidentally cooked up the scheme, estimates 100,000 people are being reached each week. Thus not only a personal or public relations program is being accomplished but a potent advertising job is also being done.

Now for the payoff. Marine National buys the time and gives it away. Actually the project has been so successful that industry would willingly pay for their share. Of course, there is a possibility that the bank figures the video time is not a pure gift. Milwaukeeans may not know all the banks in town—but they certainly know about Marine National and they are tuning in every Wednesday night like clock work.



A. O. SMITH CELEBRATES: The company's oldest employee, 58 years' service, Herman Welzien (left), being interviewed on A. O. Smith's televised 75th anniversary show Jan. 19. One of 26 such programs devoted to different industries of Milwaukee paying dividends by giving the personal, human touch to industry's public relations effort.

Canadian Steel Output Hits All-Time High In 11-Month Work Period

Toronto

• • • Canadian ingot and castings production hit a new all-time high for the first 11 months of 1948 with a total output of 2,817,899 tons. This exceeds the previous high of 2,695,397 tons turned out in the corresponding period of 1947 and 2,097,331 tons made in the first 11 months of 1946.

While November pig iron production was short of the preceding month's figure, output for the first 11 months of 1948 showed a gain of 142,380 tons over the same period in 1947. This is also a record high.

Following are the comparative monthly production figures for 1948 in net tons:

STEEL INGOTS CASTINGS		
January	247,768	8,958
February	230,183	9,463
March	275,349	10,677
April	254,815	9,951
May	279,688	9,879
June	249,710	9,655
July	238,104	6,768
August	254,362	8,692
September	248,622	9,243
October	272,127	9,739
November	267,671	10,307
Total, 11 months ..	2,817,899	103,332

PIG IRON FERRO-ALLOYS		
January	160,042	17,125
February	151,123	11,823
March	172,675	14,293
April	170,785	14,474
May	193,305	18,436
June	183,763	13,502
July	187,940	12,939
August	191,383	12,700
September	182,465	12,318
October	186,424	19,489
November	166,771	17,594
Total, 11 months ..	1,946,676	164,693

Reduces Export Tax

Brussels

• • • Belgium has reduced the export tax that was put into effect in 1947 on iron and steel products from 3 pct to 1.75 pct in an effort to further encourage foreign trade.

In August of last year the 3 pct tax was dropped on all products except those produced by the iron, steel and metal fabricating industries.

Eliminates Steel Control

Paris

• • • Liquidation of French iron and steel control by the Ministry of Industry and Commerce is hailed as an important step toward

more freedom in the iron and steel trade.

About a quarter of the iron and steel products made are no more included in the allocations program. It is expected that when steel output reaches a monthly average of 750,000 tons, all allocations will be dropped. This production figure should be hit by March of this year.

Resist Plant Dismantling

Dusseldorf

• • • Economic prospects for Germany appear excellent this year. But much political friction will mar efficient recovery. Already trouble is brewing. Workers at the Bohmer Verein plant are oppos-

ing the British in their attempt to dismantle this plant. Several attempts have been made to start dismantling operations, and each time the workers have stood their ground.

Right now about 160 plants in the Ruhr area are scheduled for dismantling and the United States as well as the Germans disagree with the program which they feel will impair Germany's return to a stable and balanced domestic economy.

Uses Noncoking Coal

Berlin

• • • A process for mixing iron ore with noncoking coal has been developed by Ludwig Weber of the Berlin Wilmersdorf Co. in cooperation with the Klockner-Humbolt Deutz Co. of Cologne-Kalk. According to informed sources, a German-French company has been formed to further study and develop the process. If found practical, it would eliminate the need for coke oven and blast furnaces.

Briefly, the process consists of mixing iron ore with noncoking quality coal which has been briquetted and subjected to low temperature carbonization. The mixture is then smelted in a low shaft furnace to produce a good grade of pig iron.

Expands Heavy Industry

Budapest

• • • Heavy industry has been given an important part in Hungary's new three-year plan. Some \$65 million has been set aside in the budget for the development of the iron, steel and other metal industries.

Considerable amounts of capital will be spent in modernizing the rolling mills at the Manfred Weiss tube works and adding iron ore, pig iron and ferroalloy facilities. Generally, the plan calls for a better integration of the nation's steel industry for productive efficiency.

Britain Sets Steel Record

London

• • • The British iron and steel industry surpassed the governments revised production target of 14.5 million tons for 1948 with an official output of 14,877,000 tons of ingots and castings.

Coming Events

- Jan. 24-28 American Society of Heating & Ventilating Engineers, annual meeting, Chicago.
- Feb. 9-10 Steel Founders Society of America, annual meeting, Chicago.
- Feb. 14-17 American Institute of Mining & Metallurgical Engineers, annual meeting, San Francisco.
- Feb. 23-25 American Concrete Institute, annual meeting, New York.
- Feb. 28-Mar. 4 American Society for Testing Materials, spring meeting, Chicago.
- Mar. 8-10 Society of Automotive Engineers, passenger car, body and production meeting, Detroit.
- Apr. 5-6 Metal Powder Assn., annual meeting, Chicago.
- Apr. 8-9 Lead Industries Assn., annual meeting, Chicago.
- Apr. 11-14 National Assn. of Corrosion Engineers, annual conference and exhibition, Cincinnati.
- Apr. 14-15 Magnesium Assn., annual meeting, Chicago.
- Apr. 18-20 Midwest Power Conference, Chicago.
- Apr. 18-20 American Institute of Mining & Metallurgical Engineers, annual Conference of Openhearth Steel Committee, Chicago.

Newly Formed Corporation Has Plans Calling for Complete Seamless Tube Mill

° ° °

By BILL LLOYD
Cleveland Regional Editor

° ° °

Cleveland

••• Plans for a complete seamless tube mill, first step toward what may ultimately become a completely integrated steel plant at Madison, Ill., across the Mississippi River from St. Louis, were announced this week by Harry H. Holloway, president of Western Reserve Steel Corp., a newly organized group, which acquired by lease two Government-owned plants in Madison.

Plans call for an initial outlay of \$7,000,000, according to Mr. Holloway, who denied that his company would spend a rumored \$14,000,000 on the initial phases of the project.

Mr. Holloway, former assistant manager of Republic Steel Corp.'s Cleveland district and chairman of the Republic flat rolled products committee, said his company will roll 30,000 tons of oil well casing a month by the third quarter.

Western Reserve has a number of customers, all in the oil business, and will not sell any steel in the open market for several months. It is thought one tube mill will be in operation within 3 months, and a second mill within 6 months.

Western Reserve will purchase tube rounds temporarily, but will be making its own steel within 6 months.

According to the Kansas City Office of War Assets Administration, Western Reserve Steel Corp.'s lease on plantors 2032 and 2349 has been approved by the Review Board in Washington, but has not yet been signed by Western Reserve.

The plantors consist of two plants under one roof, and include 110.5 acres of land. The property was formerly a steel foundry for heavy castings. Original lessees were Standard Steel Spring Co. and George A. Fuller Co. Wartime

capacity of the plant was 2,700,000 tons of steel castings a year.

Buildings include a factory building with floor area of 1,224,000 sq ft; an openhearth furnace building with floor area of 100,380 sq ft, clearance 18 ft, charging floor 38 ft; an office building, stores building, a chemical laboratory, two machine shops and a welding shop.

Original equipment included five 60-ton openhearths which have been removed. The sale did not include any equipment except two overhead cranes and eight jib cranes.

Standard Steel Spring Co. closed the plant down in the latter part of 1945. During the war it was a joint operation between George A. Fuller Co., which ran the melting shops and made ingots, and Standard Steel Spring broke the ingots down into spring slabs and made springs.

The plant was built in 1942 at a cost of \$15,690,000. Sale price tag on the property is \$2,350,000. Western Reserve Steel Corp.'s lease is for 5 years with an option to buy or renew at the end of 5 years. Western Reserve will pay \$50,000 the first year, \$150,000 the

second year and \$240,000 the third year and each year thereafter. Rent is not applicable against the sale price should Western Reserve decide eventually to buy. The property is complete with power supply, heating equipment, railroad spur.

Present plans include installation of four 70-ton electric furnaces and four 20 KVA transformers. Two electric furnaces will be installed within 6 months, and the other two within 9 months, he said.

One of the tube mills to be installed will produce pipe or casing 1 in. to 5½ OD, and the other will roll 5½ to 8½ OD.

Western Reserve has ordered a melting furnace from Pittsburgh Electromelt Co. Mill equipment is also on order. Financing is being handled by Ames Emerick & Co., a Chicago security house. Manuel M. Feinstein is the engineer on the project.

Two major producers will pierce the rounds for Western Reserve temporarily permitting the mill to get into partial operation before all the facilities are completely installed. One of these contracts calls piercing 2000 tons a month for 5 months. Calumet Steel Co. will supply tube rounds temporarily.



° ° °

BEADING: High tensile strength steel wire is being fed to a bead-building machine from large spools at a Firestone Tire & Rubber Co. plant. Beads are the part of tires which contact the rims and resist the stresses and strains seeking to pull the tire off the wheel.

° ° °

50 YEARS AGO

THE IRON AGE, January 26, 1899

• Hugo Campell of Halifax, England, left no doubt in anyone's mind what he thought about American-built milling machines when he said, "What about milling machines? It was *undoubtedly* the Americans who showed us what the milling cutter could do, and anyone unprejudiced will *undoubtedly* confirm my belief, that not only in small milling machines but also in large, plain or slab milling machines, they stand pre-eminent."

• "The first automobile truck ever made in this country has just been completed by the Fisher Equipment Co. of Chicago and is now employed by the manufacturers for their own deliveries. The truck is made for heavy hauling. It weighs 9000 lb net, and its carrying capacity is about 5 tons."

• "The present high price and strong position of copper has caused a wonderful revival of the Chilean copper mining industry." Today, the present high price and strong position of copper has given rise to strong consideration of stainless steel for gutters and downspouts.

• Businessmen will always worry—"One of the interesting questions which is arising in connection with the consolidations in the iron trade is what those who have sold out propose to do with the money which they have obtained from the sale of their holdings?"

• Information Wanted—"Who manufactures a machine called a 'deck planing machine' for the purpose of truing up floors of decks of vessels?"

• "The United States Electro-Galvanizing Co., 346 Broadway, New York, has introduced a new cold process for galvanizing, and now has a number of plants running. A glance at the old method will show clearly by comparison the advantages offered by this new process."

• "The German Emperor has approved the plans for the projected Prussian ship canal between Stettin and Berlin by which vessels of heavy tonnage will be able to load and discharge cargoes directly in Berlin."

Endorses Legislation To Clarify Pricing Muddle

Washington

••• For the first time, a high administration spokesman has endorsed the move in Congress to work out legislation (S. 236) that would clear up the muddle over industry pricing methods.

Commerce Secretary Charles Sawyer, opening witness before the Johnson subcommittee, Senate Interstate and Foreign Commerce Committee, told the group that such legislation is essential to clear up existent confusion.

As to the exact wording or form, Sawyer said he had no specific recommendation other than it should accomplish a dual purpose. This, he said, is to retain the present federal regulatory power over conspiracy, monopoly and unfair practices and at the same time leave "the decision as to what form pricing methods should follow . . . to the judgment of individual businesses."

It might well be, he said, that Congress would want to hold off any legislation until after the expected Supreme Court decision in the Rigid Steel Conduit Case—which might clear up the situation to some extent. But, he added, Congress certainly should then clear up "whatever serious uncertainties (then) remain."

Two other departments look on the proposed measure with a cold eye. Commissioner Charles E. Mahaffie, speaking for the Interstate Commerce Commission, asked elimination of the section directing the ICC to "develop a co-ordinated program of promoting competition" in handling freight rate cases.

This, he said, would compel the ICC to give more weight to the competitive factor than any other and would thus, in effect, nullify the commission's efforts to make its decisions fit the situation in "fairness to all concerned."

"Uniform flat mileage rates would be disastrous to the nation's economy," he said in response to a committee question concerning rate preferentials.

Appearing for the Federal Trade Commission, Commissioner Edwin L. Davis reiterated the FTC's position that it has not required f.o.b. pricing by virtue of its orders and legal battles.

Construction Steel . . .

••• Fabricated steel awards this week included the following:

1300 Tons, Jamestown, N. Y., addition to municipal power plant, to Bethlehem Steel Co., Bethlehem, Pa. Tonnage includes accessories.

400 Tons, Vienna, Md., power plant extension for Eastern Shores Public Service Co., to American Bridge Co., Pittsburgh.

325 Tons, Franklin Park, Ill., industrial building for Bruner & Lay Inc. to Allied Structural Steel Co., Chicago.

140 Tons, Randolph, Minn., state highway bridge section 6525 to American Bridge Co., Pittsburgh.

125 Tons, New York, N. Y. Gansevoort Market, to Grand Iron Works, Inc., New York.

100 Tons, Belle, W. Va., addition to power plant for E. I. duPont de Nemours Co., to Bethlehem Fabricators, Inc., Bethlehem.

••• Fabricated steel inquiries this week included the following:

200 Tons, East Peoria, Ill., through U. S.

Engineers Office, Chicago, a beam bridge, bids due Feb. 2.

150 Tons, Pottstown, Pa., building for Harleysville Mutual Insurance Co., due Feb. 2.

130 Tons, Sauk County, Wis., state highway bridge section F-021604, bids closed Jan. 18.

145 Tons, Winchester, Conn., two-span rolled beam bridge, Charter Oak Construction Co., Inc., Hartford, Conn., low bidder.

125 Tons, Burlington, Colo., outlet pipe, U. S. Bureau of Reclamation Spec. 525. Bids due Feb. 23.

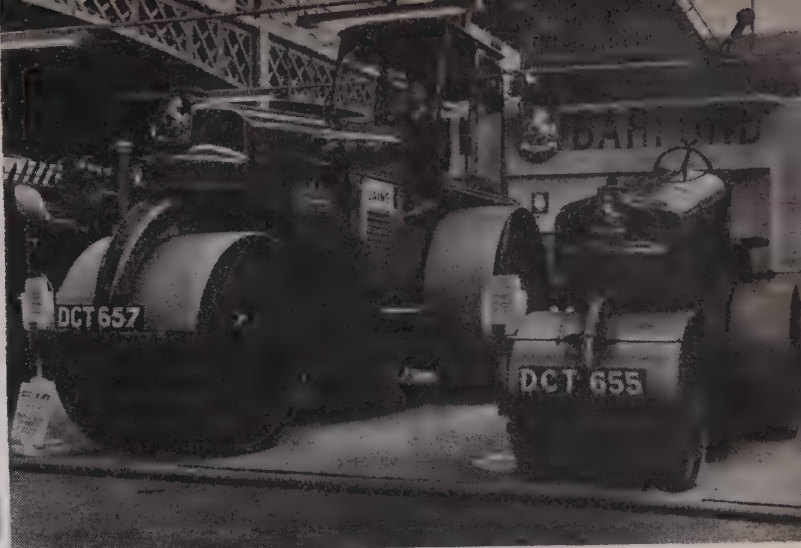
••• Reinforcing bar inquiries this week included the following:

140 Tons, Hammond, Ind., laboratory for Standard Oil Co. of Indiana.

115 Tons, Los Angeles, overcrossing on Hollywood Parkway at Edgeware Road, Calif. Div. of Highways, Los Angeles, bids to Feb. 17.

105 Tons, Chicago, service and administration building for the Chicago Transit Authority, previously reported, J. J. Duffin Construction Co. is low bidder.

Britain Displays Modern Road Making Machinery at An Engineering Congress



ABOVE

Two diesel rollers manufactured by the Aveling-Barford, Ltd. of Grantham are shown on exhibition at the public health and municipal engineering congress at Olympia.

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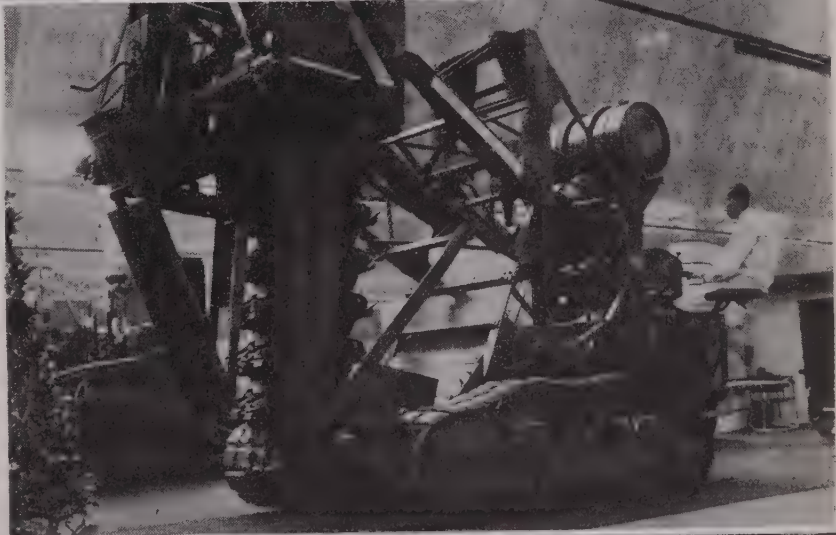
ABOVE

A caterpillar diesel tractor with a Dormer Dome perspex canopy stands in the foreground while behind it is seen a Birtley scraper with an angle bulldozer attached.

o o o

RIGHT

Here a Barber-Greene ditcher is attached to a caterpillar diesel. It has a vertical boom attached that permits compact design, visibility and maneuverability in close quarters. Tool steel teeth will cut through slate, soft stone and bituminous surfaces.



o o o

RIGHT

This Allen 12-18 trench excavator is designed to meet the demand for small trenches for electric, gas and water services. It cuts an average of 300 yards of trench, 13 in. wide and 3 feet deep, per day.



Steel Items Still Tight in Canada Consumers Watch U. S. Markets Longingly

Toronto

• • • Canadian steel producers do not hold to the same opinions as some of those expressed recently in the United States to the effect that there will be early easing in the iron and steel supply situation. Of course Canadian interests are referring to conditions on this side of the border, and their expressions deal chiefly with domestic output.

However, they may be overlooking an important bet, a possible big jump in steel imports from the States. In this event much pressure would be withdrawn from Canadian mills, and producers could return to more normal practice of meeting demands of consumers, other than those which depend largely on American steel for their requirements. Also, it is apparent that Canada is receiving more British and Belgium steel, which may have a tendency to improve the supply situation here.

Canadian mills are booked solid through the first quarter and report no surplus capacity available

for this period. Inquiries continue numerous and consumers are making special efforts to obtain larger tonnages. On sheets, plate and carbon bars the supply situation is decidedly short, but some interests see hopes of easing on these lines through early increased importations from the United States. Structural shapes are also in short supply with no early improvement indicated. Wire and nails also are scarce and despite increased production in recent months consumers still find it almost impossible to obtain supplies.

Demand for merchant pig iron is running well ahead of supply, which is largely due to the shortage of scrap materials. Mill producers point out that as a result of the serious scrap shortage, it has been necessary to make greater use of pig iron in steel making, thus making it necessary to withdraw large tonnages of iron that in more normal times went to merchant melters. Foundry interests in turn have had to turn to pig iron as the major item in their melting

operations as iron scrap is scarce and currently quoted above pig iron prices for what tonnages are available.

Canadian blast furnace operators have revised basing points for setting prices, thus Algoma Steel Corp., the largest supplier of merchant iron now quotes base grade, 2.25 silicon and under, \$44.50 and malleable iron at \$45.50, Sault Ste. Marie, which brings the delivered prices Toronto to \$49.30 per gross ton for foundry iron and \$50.30 for malleable. Montreal prices are \$2.50 per ton above the Toronto quotation.

Canadian steel mills are maintaining production at virtual capacity, but it is not expected that production for the current year will show much improvement over that for 1948. Steel production in Canada is handicapped by shortage of steelmaking scrap and there are no indications of early improvement in this situation. For some time large scrap consumers have been scouring the world for supplies and while they have met with some success which has enabled them to maintain high production schedules, the immediate future is far from bright.

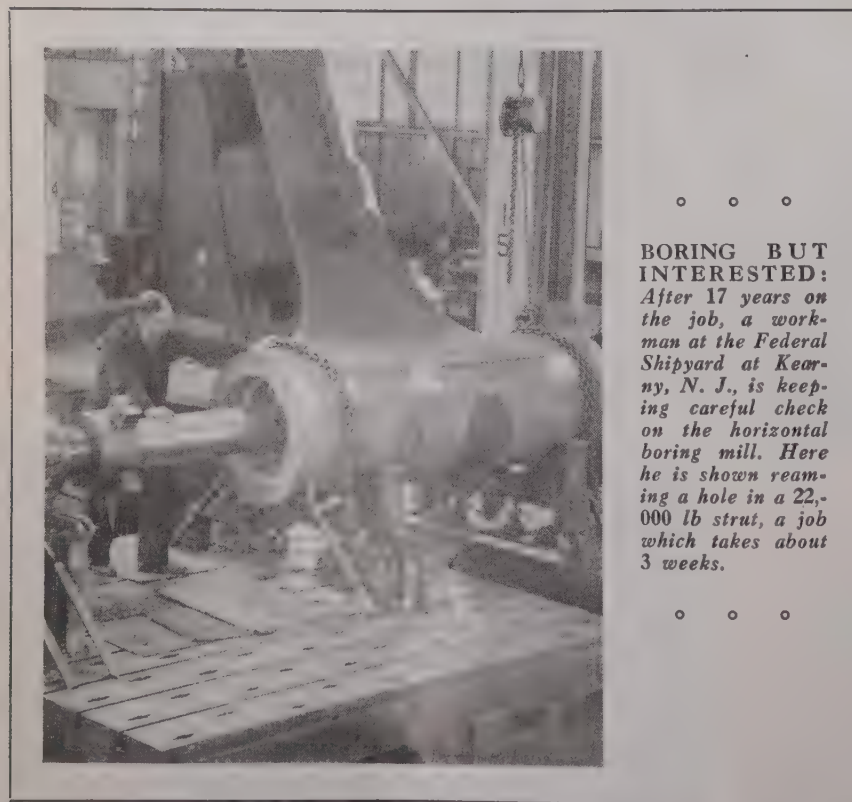
With domestic steel scrap prices under ceiling control, collectors point out that there is no inducement to go into the rural areas and seek scrap. In fact some farmers have been offered as low as \$5 to \$6 per ton for steel scrap which does not make it worth gathering. However, a survey of the farm communities has revealed the fact that on most farms in Ontario anywhere from a ton to five tons might be collected.

On cast scrap, where no government ceiling prevails, dealers are paying \$44 to \$48 per gross ton and in some instances above this level. But the supply situation generally is short, while stove plate has practically disappeared from the market.

Ore Shipped to Japan

Salt Lake City

• • • A 10,000-ton shipment of iron ore from Iron Mountain, Utah left Long Beach, Calif. for Japan recently. The ore was mined and shipped by the Utah Construction Co.



• • •
BORING BUT INTERESTED:
After 17 years on the job, a workman at the Federal Shipyard at Kearny, N. J., is keeping careful check on the horizontal boring mill. Here he is shown reaming a hole in a 22,000 lb strut, a job which takes about 3 weeks.
• • •

OIC Plans Hearings To Review Steel And Pig Iron Allocation

Washington

••• Public hearings will be held by the Office of Industry Cooperation during the last week in January for the purpose of reviewing steel and pig iron needs for housing and building materials.

Voluntary iron and steel allocations for housing purposes now provide monthly set-asides of 102,810 tons of pig iron for cast iron items, 31,625 tons of steel for making warm air heating equipment, and 9835 tons for the manufacture of all-steel prefabs.

The OIC is proceeding on the theory that Congress will extend the voluntary allocations program past the present expiration date of Feb. 28. (THE IRON AGE, Dec. 30, 1948, p 75). With the exception of anthracite mine maintenance allocations and the above mentioned programs for housing items, the OIC has approved extension of existing programs through Aug. 31.

Indications are that after a thorough going over at the coming meeting, pig iron and steel allocations for housing purposes may be wrapped up into a single program package.

In the meantime, three new allocation programs have been approved by OIC's Steel Products Advisory Committee—as well as a boost in quota for an existing program. All four become effective next month and will also continue through Aug. 31.

The new programs and their monthly allocation quotas are: mining machinery manufacture and repair (exclusive of 2570 tons for anthracite mine maintenance), 31,785 tons; special Canadian ore cars, 2576 tons; and, for farm-type grain storage bins, 8400 tons.

Manufacturers of oil field tanks and production equipment will have their allocations increased from the previous 16,530 tons monthly to 18,530 tons.

Under the new agreements, steel for the ore cars will go to the Canadian Car & Foundry Co., Ltd., for manufacture of special cars for use in South Africa. They will transport manganese ore from the interior to the tide-

water for ocean shipment—mostly to the United States for bolstering American manganese supply.

Under the agreement for grain bin steel, 8000 tons of 18-26 gage galvanized sheet plus 400 tons of heavier gage hot rolled sheet and bar-size angle irons would be assured for the 6-month period.

The third new agreement originally set aside 26,400 tons for making mining equipment; later the amount was raised to 31,625 tons. This is in addition to the monthly allocation of 2570 tons for maintenance of anthracite mines equipment—which has not yet been extended beyond the original Feb. 28 expiration date.

This brings to 14 the number of voluntary allocation agreements which are now or are about to be in effect. They involve slightly less than 555,000 tons of steel monthly.

Monthly Steel Requirements
For Voluntary Allocations

Program	Tons
Domestic Freight Cars	250,000
Armed Forces	102,505
Oil Tankers	40,380
*Mining Machinery	31,785
**Heating Equipment	31,625
Freight Barges and Tugs	25,000
Oil Field and Tanks	16,530
Atomic Energy	16,414
Merchant Marine	15,415
**Prefab Housing	9,835
*Steel Grain Bins	8,400
*Canadian Ore Cars	2,576
**Anthracite Mining	2,570
National Aeronautics Council	1,976
Total	555,011

* Newly approved programs which will expire August 31.

** Only existing programs which had not been extended another six months, as of Jan. 15, 1949.

77 Vessels on Order

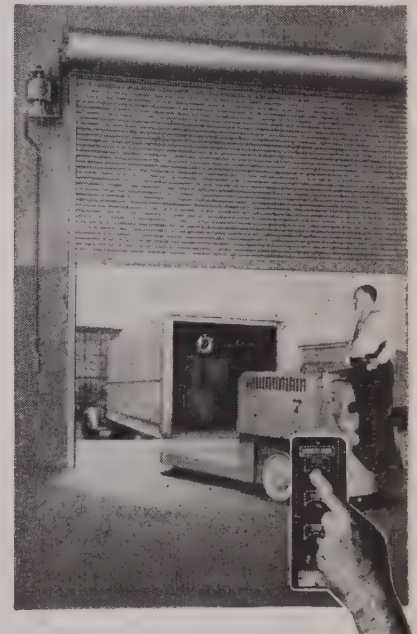
New York

••• The private shipyards of the country had on order or under construction, as of the first of December, 77 seagoing merchant vessels of 1000 gross tons and over, aggregating 1,201,130 gross tons, and two dredges totaling 24,672 displacement tons, according to the Shipbuilders Council of America.

Of the seagoing vessels, 66 are tankers, two of which are scheduled for delivery before the end of the year. The remaining vessels consist of two passenger liners, three combination passenger-cargo ships, three trawlers, two ferry boats and one ore ship.

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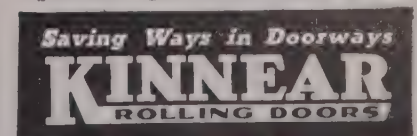


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How Bliss Met Revere's Tough Rolling Mill "Specs"

Smooth-surfaced non-ferrous strip to exceptionally accurate, uniform gage...quick, precise adjustment during rundowns...variable, fast rolling speed...extreme versatility throughout...those were requirements for three new rolling mills that Revere Copper and Brass put up to Bliss.

"We knew what we wanted," says H. A. Ray, Assistant Plant Engineer at Revere's New Bedford Works, "and Bliss was able to deliver. On our new intermediate rundown mill there's a collapsible block with vertical-type wrapper with an Up Coiler for heavier gage. We use the Up Coiler for strip from

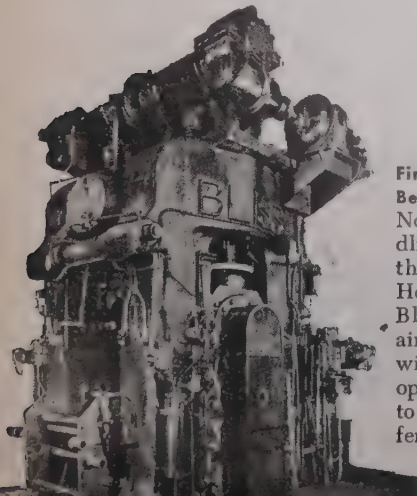
about .125" down to .060"—then we use the block for metal down to .016". This arrangement is compact, and I can tell you it's efficient.

"Another thing we like is the air-operated sticker guide that Bliss developed to meet our various width requirements. On our new finishing mill, they gave us air-operated side guides immediately adjustable to handle any width we're running. On that mill, we can roll copper strip down to .005"—true to gage, 24 hours a day."

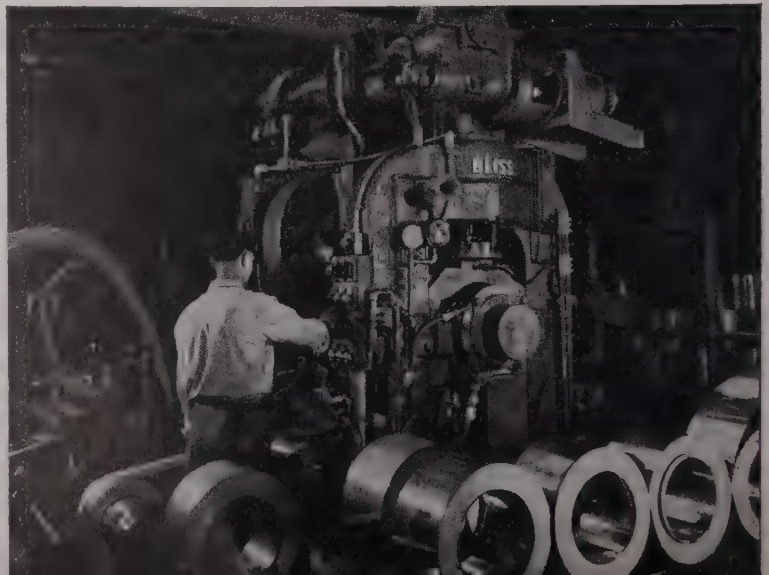
Precision Rolling to "Tenths"

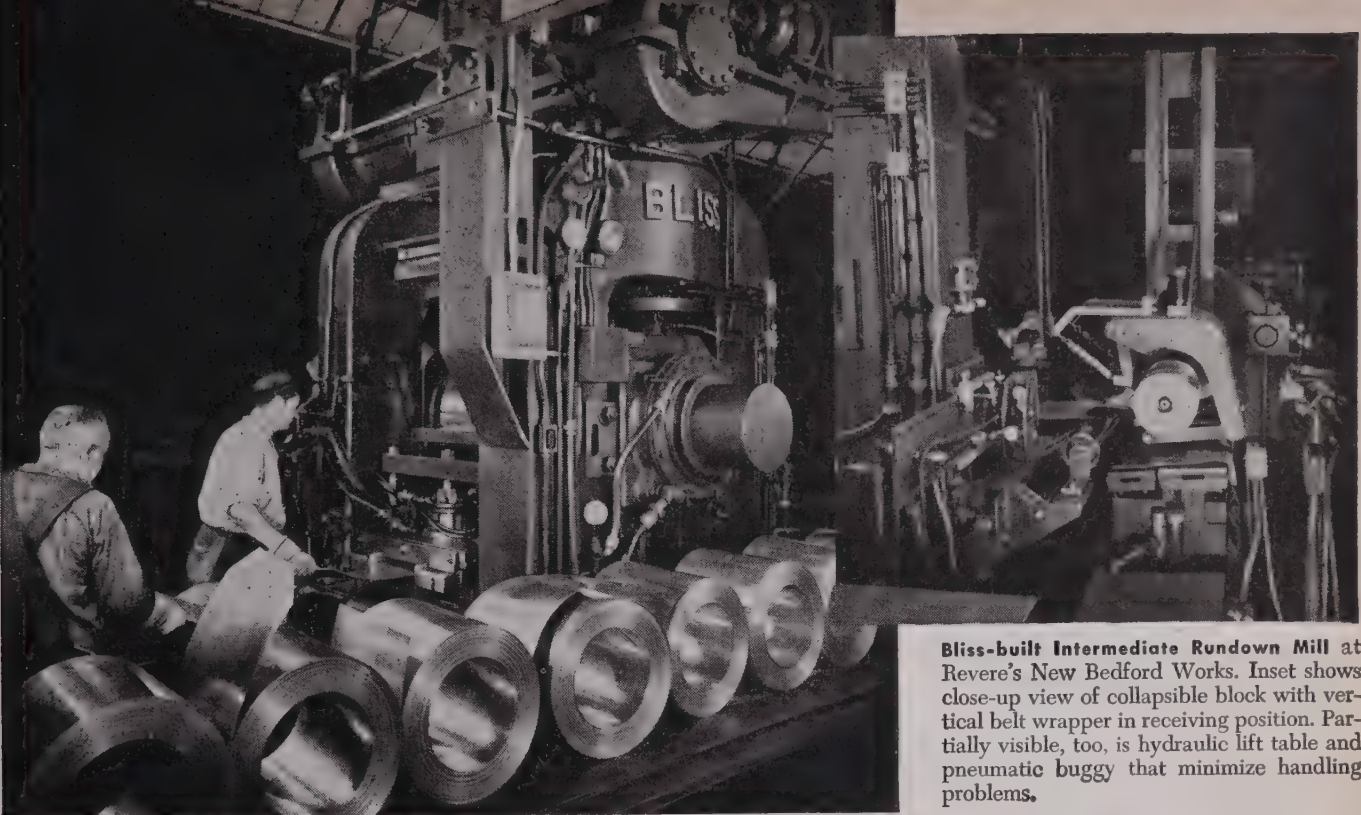
Down in Baltimore, at Revere's Canton Works,

"Old Faithful"—This 14" and 29" x 30" 4-high mill for 1st rundown of copper and copper alloy strip has seen continuous service in Revere's New Bedford plant for over 17 years.



Finishing Mill at New Bedford Threads Up. Note the sleeve handling mechanism at the receiving end. Here, too, is another Bliss original—the air-operated sticker with adjustable air-operated side guides to rapidly handle different coil widths.

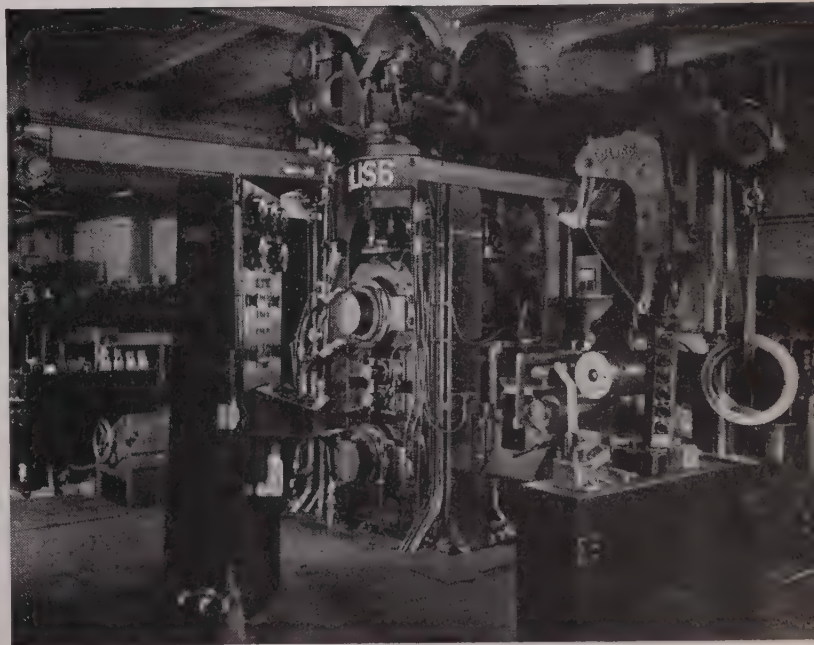




Bliss-built Intermediate Rundown Mill at Revere's New Bedford Works. Inset shows close-up view of collapsible block with vertical belt wrapper in receiving position. Partially visible, too, is hydraulic lift table and pneumatic buggy that minimize handling problems.

there's an even more spectacular story. Here Revere precision-rolls copper strip to .012" within .0002"—using a Bliss-built mill specially engineered for the job. There's variable, synchronous tension on pay-off and wind-up reel to assist in run-down, and instantaneous control of tension, winding speed and screw-downs from roller's centralized control panel. It's smooth-surfaced strip—double-checked with X-ray Thickness Tester and air micrometers.

Yes, for the engineered refinements that make for maximum production—for the rolling mill performance you want, put your problem up to Bliss. You'll get the same keen counsel that's made Bliss the first name in presses for more than 90 years.



"Tape Mill" at Canton Works in Baltimore—designed for precision-rolling of copper tape for coaxial cable to gage .012" within .0002". X-Ray Thickness Tester mounted on exit side gives constant gage indication and roller's control panel permits immediate correction of adjustment during rolling to hold tolerance.

E. W. Bliss Company

DETROIT 2, MICHIGAN

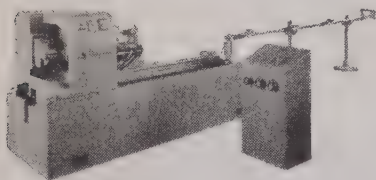
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Sees Good Profits For Appliance Dealers Who Step Up Sales Efforts

Chicago

• • • Although the electric appliance industry has returned to its historically normal condition characterized by sharp competition, 1949 will be a year of good profit opportunities for dealers who step up their sales efforts to match increasing resistances, Leonard C. Truesdell, vice-president of marketing, Hotpoint, Inc., said recently.

The industry is as sound as at any time in its history; but, the application of proved selling fundamentals, frequently unnecessary in the postwar period, must be resumed to maintain a high level of sales, he said.

Record production in 1948 satisfied the pent-up demand for nearly all major appliances and brought inventories to dealers for the first time in postwar. However, electric utility expansion, high employment and wage levels, home building programs, and a growing farm market will combine to create increased markets and keep business good for a long time to come, he said.

Present high materials and labor cost, make downward price revisions unlikely during the period ahead, he said. Although some price adjustments are inevitable, competition among manufacturers will more likely take the form of new products and new product features to increase the sales appeal of work saving appliances, Mr. Truesdell said.

Marketing programs will include larger national advertising budgets with continuing emphasis on sales training and product promotion to give retailers maximum assistance in selling appliances. Further strengthening and refining of retail organizations will be carried out in the year ahead, with manufacturers competing for the strongest dealer outlets.

Mr. Truesdell said that five major elements will have a strong bearing on the appliance industry, just as they affect the overall national economy: employment, income, demand, sales and production. Current employment is substantially above the 56 million level in 1940. In 1948 the \$5000 and up income group, a prime mar-

ket for major electric appliances represented 21 pct of all American families, or a total of 8.8 million family units. This was a 20 pct increase over the 1939 level.

Growing demand, backed by ability to buy, is illustrated by the 75 pct increase in the amount of money available for the purchase of goods and services, he said. Discretionary expenditures in 1948 were approximately \$118 billion, compared with \$68.3 billion in 1940.

Estimated 1949 sales for nearly all major appliances will reach or exceed peak levels attained in 1948, he said. Steady expansion of the market for electric ranges, disposals, dishwashers, and water heaters, appliances that have low saturation were viewed as the biggest new factor in the 1949 outlook. All of these appliances are enjoying unprecedented acceptance, he said.

Corporations' Working Capital Shows Increase

Washington

• • • Net working capital of United States corporations increased during third quarter 1948 by \$1.5 billion to reach a new high figure of \$65.4 billion, according to the Securities & Exchange Commission.

Business was not much better off, however, at the quarter's end than three months previous, despite the rosy appearance of statistics.

During the quarter, corporations extended additional credit to the tune of \$2.6 billion in notes and accounts payable. At the same time, they built up inventories by \$1.7 billion and thereby boosted their own notes and other debts by \$2.4 billion.

Increased wealth means increased taxes. The tax bite for the third quarter rose by \$400 million, leaving business in about the same position as for the second quarter.

As figured by the SEC as of Sept. 30, the nation's corporate position was about this (in billions of dollars):

Inventories, \$44.6; notes and accounts receivable, \$41.3; government and other securities held, \$13.0; notes and accounts payable, \$36.2; and, tax liabilities, \$10.6.

Youngstown Sheet & Tube Co. to Double Its 1948 Expansion

Youngstown

• • • Youngstown Sheet & Tube Co. will spend \$16 million on additions and betterments to its plants this year, compared to the \$8,750,000 spent in 1948, according to company officials. Major improvements will be made in the Chicago district plants, although extensive work is planned for the Youngstown district.

Youngstown district projects announced are: completion of the No. 5 boiler house extension at Campbell and installing one boiler; installing new tar precipitators and building a surplus gas holder at the Campbell coke plant; installing two reaming machines and a roll lathe for the seamless tube mills at Campbell; installing an air compressor and piping in No. 7 electric substation at Campbell, and building an extension to the rod mill building at Struthers.

Installing new bull blocks, cut-off and straightening machinery and pointers for the cold drawn bar department at Brier Hill; new pull-out stands and plate edge blasting equipment for the electric weld tube mill at Brier Hill, and purchase of two diesel locomotive cranes.

Chicago district projects are: installing a continuous butt weld tube mill; installing a new continuous furnace for the 10-in. skelp mill and additional stands to increase output; additional work on No. 1 blast furnace which was rebuilt during 1948; two new charging machines, a scrap baler and a new wash and locker building for the openhearth department; completion of the blast furnace fuel system and installation of a new approach table and ingot turnover in the blooming mill; and new billet conditioning equipment to handle 40-ft bars at the 10-in. merchant mill.

Alterations to the hot strip mill to handle thick slabs; installation of a 2-stand temper mill in the cold strip department; provision of electrolytic reflow power in the tin mill; extending the power house building and installing turbo-blowers, and purchase of three new diesel locomotives.

Projects for subsidiary com-

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panies include: installation of new presses and machine tools in the Youngstown Metal Products Co., Youngstown; continuous mining machines and a slate disposal aerial tramway for the Buckeye Coal Co. at Nemacolin, Pa., and construction of a coal washing plant and slate disposal aerial tramway and provision of new shuttle-car equipment and substa-

tions and equipment for Youngstown Mines Corp., at Dehue, W. Va.

The company's major project in 1948 was rebuilding its No. 1 blast furnace in the Chicago district. Another 1948 project called for a 75-oven byproducts coke plant in the Chicago district, but work on this was delayed because of high prices.

FTC Does Not Favor System of Mandatory F.O.B. Mill Selling

Washington

• • • The Federal Trade Commission finally went on record last week as saying that it did not favor mandatory f.o.b. mill selling methods.

The commission's long-awaited opinion was presented in a letter to B. C. Davis, Jr., secretary of the New York State Chamber of Commerce. The letter was signed for the 5-man commission by D. C. Daniel, FTC secretary.

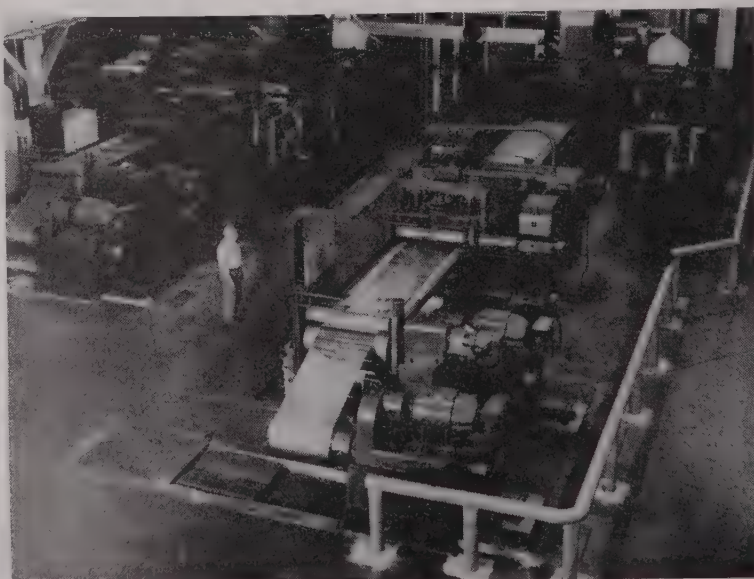
In reply to Davis' question, "Does the commission favor imposition of mill-f.o.b. pricing?", the FTC members stated, "the commission does not advocate the imposition of a requirement that business enterprises price their goods f.o.b. mill or that they use any

other form of geographic pricing practice.

"In the commission's opinion," the letter continued, "one of the principal virtues of the antitrust laws is the fact that they maintain freedom of choice and variety of behavior among business men, forbidding only the specific practices and conditions which have been condemned by law as destructive of competition."

It is expected that the commissioners will present the same view when they testify before the Senate Trade Policies Subcommittee next week. Previously, a number of members of Congress had sought FTC's views on f.o.b. selling. The views expressed by FTC in its letter to Davis are significant in that they reflect the first clear-cut commitment by the commission in the controversial f.o.b.-v.-delivered price controversy.

CONTINUOUS LINES: Two 20,000 lb per hr continuous annealing lines for 42 in. wide strip extend some 26 ft below and 32 ft above floor level in the Philadelphia plant of the Drever Co. Shown here is the entry end of the strip feeding and degreasing equipment and the 1820-kw vertical strip furnace.



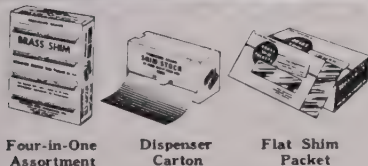
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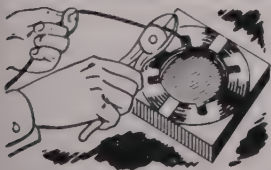
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New dispenser carton makes using Precision Brand Music Wire fast and easy—just pull, cut and replace end. Coil stays in the carton. Wire is finest quality, cold drawn through dies with micrometer precision. Available in thicknesses from .004" to .180"; 1/4 lb, 1/2 lb, and 1 lb. cartons. Also in bulk.

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New Type of Alloy Steel Improves Mold Hobbing

Pittsburgh

• • • One of the more useful recent developments for the plastics industry is an alloy steel soft enough to be hobbled. Hobbing is the process by which most multiple-cavity plastic molds are made. It involves forcing a hardened master impression into softer steel, at pressures of several tons per sq in., to produce in reverse a duplicate of the master.

Normally the impression is made in soft low carbon, low alloy steels. These molds or mold cavities are then hardened by pack carburizing and liquid quenching. Sometimes this heat treatment leaves a scaled, cracked or distorted result.

Westinghouse engineers have developed an alloy steel soft enough for hobbing yet with properties permitting it to be gas carburized in an Ammogas furnace. Hardening follows in the furnace's protective atmosphere cooling chamber. Hobs made this way are said to be clean and bright, crack-free and virtually free from distortion. One or more tool steel companies now sell steel with these properties.

Appointed Consultant on Iron and Steel to OIC

Washington

• • • A. A. Wagner of Pittsburgh, Pa., has been appointed chief iron and steel consultant to the Office of Industry Cooperation. Since last March, Mr. Wagner has served as an adviser to OIC on loan from the Jones & Laughlin Steel Corp., Pittsburgh.

Born in Cazenovia, N. Y., Mr. Wagner attended schools in central New York State, receiving a civil engineering degree from Syracuse University in 1907. Following 2 years of employment by the New York State Barge Canal, he joined the sales department of the Jones & Laughlin Steel Corp. He was associated with this firm for 40 years, serving most recently as assistant to the vice president in charge of sales.

During World War II from 1941 to 1945, Mr. Wagner was on loan from the steel industry to serve in the War Production Board as chief of the Bar and Semi-Finished Materials of the Iron and Steel Div.

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New England Business Reported Spotty, But Total Volume Steady

Boston

••• Increasing spottiness characterized manufacturing output in New England during the final quarter, continuing a sagging trend in evidence since March, according to a report by the First National Bank of Boston.

The index of industrial activity compiled by this bank was 148 in November, with 1935-39 as 100. This was 9 pct below the corresponding month of the previous year. The report says it is likely that aggregate production for the past year will be about the same as that for 1947.

High levels of output, by comparison with any prewar yardsticks, have filled pipelines and brought supplies progressively into balance with demand in added lines. This necessitated adjustments to meet less urgent con-

sumer buying and to avoid overproduction, it was explained.

While the diversity of industry in this region has proved beneficial, this adjusting process has resulted in sharper fluctuations in shoe, cotton goods, and wool textile industries as seasonal patterns similar to prewar years have returned.

Similar influences have affected a number of other product fields where general activity is narrowly below a year ago, the report says. These include furniture, confectionery, paper, rubber goods, machinery, apparel, and some electrical goods.

"Demand apparently continues in excess of supply, and operations higher in rayon goods, carpets, textile machinery, heavy electrical apparatus, knit goods, and radio parts for television. Shipbuilding is ahead of last year, and orders on hand indicate further gains next year."

Oliver Gives Foremen Customer Angle; Speeds Its Shipping Schedules

Pittsburgh

••• Keeping foremen informed is paying dividends for the Oliver Iron & Steel Corp., here. Delivery of material on schedule is roughly 200 pct better than it was a few months ago, according to Paul Startzman, general manager. Oliver makes industrial fasteners and pole line hardware.

Once a week Mr. Startzman holds a meeting on production problems with top management men and once a month with the foremen. "Foremen," he says, "must understand the importance of the jobs they are doing in order to get those jobs done satisfactorily. It is just as important that they should be oriented to the problem of supplying customers as it is that a football team should understand the signals of the quarterback." The Oliver foremen orientation program was started 5 months ago.

Supervisory employees are given the overall picture in these meetings. They are getting accustomed to considering the different plant departments as "customers." The result is that these departments are getting closer to receiving what they want when they want it, and in the right amounts. And there is less recycling within the plant.

"Shipments," Mr. Startzman told THE IRON AGE, "are being made more nearly on schedule and with less error than previously." He credited the remarkable overall improvement to the way in which foremen were getting acquainted with customer needs and wants.

Four-Man Mission Probes Japan's Scrap Potential

Washington

••• A four-man mission to survey the availability of heavy iron and steel scrap in Japan has been appointed by Secretary of Commerce Charles Sawyer. It was scheduled to arrive in Japan on Jan. 11.

Sponsored jointly by the Depts. of Commerce and the Army, the mission will survey the scrap and steel industries of Japan and recommend how much scrap the Japanese economy can spare for shipment to the United States.

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(CONTINUED FROM PAGE 102)

- **Roger S. Schofield** has been placed in charge of transportation sales of the Philadelphia district office, Baldwin Locomotive Works, replacing Walker H. Evans who has recently been promoted to district manager. Mr. Schofield came to Baldwin in 1942 and in 1945 was assigned to the sales staff of the Philadelphia district office.
- **Howard R. Wunker** has been appointed regional sales manager for Crosley Motors, Inc., in the area of Mississippi, Louisiana and Arkansas, establishing his headquarters in Jackson, Miss.
- **W. Van C. Brandt** has been appointed manager of the new Exide Railway and Motive Power Sales Div., Electric Storage Battery Co., Philadelphia. Mr. Brandt had previously served as manager of Exide Motive Power Battery Sales.
- **Victor G. Lottmann** has been named assistant to the executive vice-president of Ford Motor Co., Dearborn. In addition to his new duties, Mr. Lottmann continues to direct commodity research for the Purchasing Div. He joined Ford in 1946.
- **Earl R. Deahl** has been named district sales manager of the Chicago division of the Upson Co., Lockport, N. Y. Mr. Deahl has been associated with the Upson Co. since 1943 as a field sales representative.
- **J. A. Robinson** has been appointed sales manager for the transporter division of Automatic Transportation Co., Chicago. Mr. Robinson comes to Automatic from Ruthrauff & Ryan, Inc.
- **Milo A. Nice** has been named assistant manager of the technical service division of the Explosives Dept., Hercules Powder Co., Wilmington, Del. **Arthur H. Sibley** has succeeded Mr. Nice as assistant manager of that department's New York office.
- **Albert J. Doermann**, formerly president of Titan Abrasives Co., Chicago, has been elected chairman of the board. **Leo E. Jacobs** has been named president and director of the company.
- **Robert F. Edwards** has been appointed section engineer in charge

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PERSONALS

of the synchronous motor and vertical generator section of the Ridgeway Div., Elliott Co., Jeannette, Pa.

• **R. F. Kendall** has been appointed credit manager, Reliance Electric & Engineering Co., Cleveland. Mr. Kendall has been with the credit department of the company since early 1947. **Claude V. Harp, Jr.**, has been appointed to the staff of the Houston office of Reliance. Mr. Harp joined the company in 1941 and has been connected with their home sales organization in Cleveland.

• **T. Kennedy Stevenson** has retired as vice-president and director of Western Electric Co., after 34 years with the company, and has been elected to the board of directors of the Griscom-Russell Co. as chairman of the executive committee. Mr. Stevenson has his headquarters at Griscom-Russell's offices in New York.

• **Harry Reichert** has been appointed acting manager of foreign sales for the Niles-Bement-Pond Co., West Hartford, Conn., carrying on the work of **Alexander S. Keller**, vice-president and manager of foreign sales, who has taken a year's leave of absence to serve as senior industry officer in the Netherlands Mission of the Economic Cooperation Administration.

• **John J. Huether** has been named manager of the central station divisions of General Electric Co., Schenectady, succeeding **Ralph M. Darrin**, who has been elected a commercial vice-president assigned to customer relations work in the New England territory. Mr. Huether joined G. E. in 1922. He continues as manager of the transportation division, a post he has held since early in 1948. **A. R. Hines**, formerly manager of the apparatus department office of the company in Philadelphia, has been appointed manager of the newly-established Michigan sales district of that department. **V. J. Snyder** and **C. M. Dunn**, now assistant managers of the Detroit local apparatus office, have been designated assistant managers of the new district.

• **A. A. Gustafson** has been appointed representative in the Minnesota and Iowa territories for the Palnut Co., Irvington, N. J., with headquarters in St. Paul.

• **William L. Davidson** has been named director of the physical research department of the B. F. Goodrich Co., Akron, Ohio. Dr. Davidson has been with Goodrich since 1940. He is an international authority on atomic energy. **Glenn E. Martin** has been named manager of sales planning for the replacement tire sales division of the company. Mr. Martin had been manager of retail advertising in the division's sales promotion department since 1941. **Clifford E. Copp** succeeds Mr. Martin. Mr. Copp had previously served in the sales promotion department.

• **Bruce E. Horst** has been appointed sales representative in the Rockford, Ill., territory for Barber-Colman Co., succeeding **E. J. Benesch**.

• **J. H. Burrus** has been promoted from assistant manager to manager of the Portland district of Allis-Chalmers, Milwaukee. Mr. Burrus succeeds **F. V. Sams**, who is retiring after serving the company 43 years.

• **Edwin F. Bates** has been advanced from works manager of the Red Lion plant to plant manager, and **Lee N. Blugerman**, formerly assistant works manager, has been made works manager of the same plant of the Budd Co., Philadelphia.

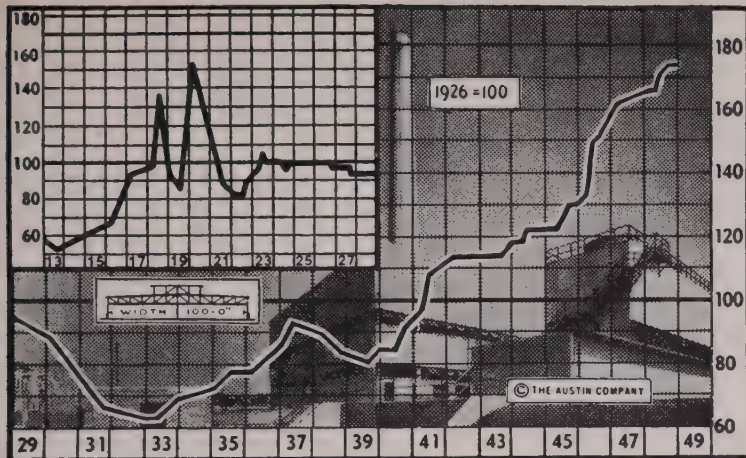
• **Charles D. Patterson** has been appointed purchasing agent of Chase Brass & Copper Co., Inc., Waterbury, Conn., succeeding **Arthur G. Evans**, who retired after more than 46 years of service. Mr. Patterson has served as assistant purchasing agent since 1946.

• **H. L. Francis** has been appointed Eastern traffic and transportation manager, Koppers Co., Inc., Pittsburgh. Mr. Francis, whose headquarters are in Kearny, N. J., continues his present duties with the Gas & Coke division and in addition serves as the company's traffic and transportation representative in the New York City-New Jersey area.

• **James W. Pollard, Jr.**, has been named assistant superintendent, Lithopone division, Glidden Co., Baltimore.

(CONTINUED ON PAGE 152)

INDUSTRIAL BUILDING COSTS



Cost of Industrial Building Stable At Third Quarter Level

Cleveland

• • • Stabilization of the Austin Co.'s index of industrial building costs at the third quarter level, after a series of quarterly advances, interrupted but once since 1945, is reported by George A. Bryant, Austin Co. president.

The Austin Co.'s index at the year-end stood at 174, unchanged since the third quarter of 1948, and less than 5½ pct above the level reached a year ago, Mr. Bryant reported.

"The continuing advance in some building material prices and certain labor rates during the clos-

ing months of the year have just about been offset by our improved ability to get the materials required for projects as needed and to man our jobs with competent labor," he said. "These factors, together with moderate reductions in the price of lumber, have been responsible for stabilization of the index at the third quarter level, after a series of quarterly advances which has been broken only once since 1945."

He indicated that further price increases during 1949 were almost inevitable, particularly if the requested freight rate increases are granted, but there is reason to expect that future rate and price adjustments will have only a very moderate effect on overall industrial building costs in the aggregate.

Granite City Production

St. Louis

• • • New all-time production and shipping records were established by Granite City Steel Co. during 1948, according to Hayward Niedringhaus, president.

During 1948, the company produced 494,000 ingot tons—an increase of approximately 12 pct over the 1947 total of 440,000.

The over-all increase in steel shipments was even greater than the jump in production. Some 409,000 tons of steel were shipped in 1948 compared with 345,000 tons in 1947. This is an increase of almost 19 pct.

Asks Plant to Stay Open

Syracuse, N. Y.

• • • United Auto Workers, CIO, has asked Remington Rand not to close its plant here, according to Francis X. O'Mealia, subregional director of the union. Mr. O'Mealia said that the union had met with management representatives and expressed a willingness to make reasonable adjustments to keep the plant in Syracuse.

Remington Rand had previously announced that it would end production of portable typewriters here and resume their manufacture at the company's plant in Hillington, Scotland.

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MACHINE TOOLS

... News and Market Activities

Machine Tool People Find it Tough Going to Get New Orders

• • • Reports from major sales sectors this week indicated that machine tool companies are going to have to get in and slug for every order they get, apart from the special projects like ECA and the National Defense Program.

January business has been spotty. ECA orders are coming in, but indications are that business from this source will not reach normal volume until the fourth quarter. More companies are being asked to quote on NDP projects, including those at Kansas City and Milwaukee.

South American business is touch and go at the moment. Brazil has limited imports to 25 pct of the available dollar exchange, according to reports which has put a serious but temporary crimp on machine tool orders.

In general 1949 has been outlined as a year of replacement orders for the industry and nobody questions that the biggest opportunity for the industry this year is to sell machine tools for cutting costs. The industry is back to that part of the cycle.

On the other hand, the recent development of soft spots has made buyers cautious and sales representatives of some segments of the industry are of the opinion that if current buds of recession burst forth in full flower, the industry will do well to reach 70 pct of the 1948 volume. But recent price increases, latest of which was made by Gisholt Machine Co. in Madison, Wis., suggest that this is an isolated view.

In Detroit, most machine tool builders continue to live in hopeful expectancy. However, there is fair agreement that the immediate outlook for the industry is not too promising. Builders of special machine tools, for example, who have had a lean January, now find it will probably be past midyear before any improvement in business even if it comes, can be reflected in their dollar income.

January Business Spotty With Bigger ECA Business Not Due Until Later

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There is also a growing realization here that after proper allowance is made for changes in the value of the dollar, there are a comparatively large number of companies competing for each dollar's worth of available business.

Press manufacturers, similarly, are finding themselves in a declining market for new equipment although considerable interest is still apparent, particularly in new presses and automatic materials handling equipment for presses.

Local machine tool suppliers are anticipating some placements in the near future for the new general motors technical center which has recently been given the green light. There are also hopes that commitments for special tooling for an automatic transmission will soon be made by Borg Warner. There is a trickle of government work in this area but this volume has been offset to some extent by some recent cutbacks by the Army Air Force.

In Philadelphia, big news in the machine tool business is the release by the Navy of the big Westinghouse Kansas City gas turbine plant. Orders have not yet gone out but the trade here expects early action. Estimates here place dollar volume at \$5 million. There are, according to reports, several other major tool buying projects on schedule which to date have not been approved. Dealers are optimistic as to the expected volume of business in this area during the third and fourth quarters.

Trade reports here hinted that some tools are being released for shipment to certain of Russia's satellites. In this regard, most important item that has come to the

fore thus far is a \$65,000 unit released for early shipment.

Members of the machine tool trade here regret the impending resignation of Lloyd J. Hinman, attached to the undersecretary of the Navy and in charge of machine tool procurement. Mr. Hinman is retiring at the end of January.

In Cleveland, Warner & Swasey Co., on strike since Dec. 27, has rejected an offer by 1800 striking members of the International Assn. of Machinists to end their strike if the company will agree to submit the wage dispute to arbitration, it was reported this week.

According to Matthew De More, chief of IAM's District 54, the offer was made by the union after a meeting of both sides with Federal conciliators.

Machine tool orders and shipments in December registered an increase over the preceding month, according to the National Machine Tool Builders Assn. monthly index. NMTBA's new order index for December was 76.7 as compared with 72.2 for November. Index of shipments was 96.9 as compared with 76.2. The index of foreign orders declined slightly to 16.2 as compared with 18.1 for November. Ratio of unfilled orders to shipments was reported at 3.2-1 as compared with 4.4-1 for November.

Doubles Net Profit

Cleveland

• • • Net profit of Ohio Seamless Tube Co., Shelby, Ohio, during 1948 more than doubled earnings of the preceding year, W. C. Connelly, president, reported to stockholders this week.

Net for 1948 was \$1,489,944, equal to \$9.47 a share, as compared with \$674,000, or \$4.29 a share, for 1947. Mr. Connelly said sales were also substantially higher than 1947 levels.

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Lead and Zinc Producers Report Offers of Foreign Concentrates

New York

• • • Producers of lead and zinc have been flooded recently with offers of concentrates from many countries with which they have no previous experience. Zinc concentrates are being bought from Canada and from several countries in South America. Offers have been received from Europe. Lead concentrates are being bought from Central and South America, and Europe. Lead concentrates are generally not imported from Canada, as they would have to be shipped as far as St. Louis for smelting. This development indicates the effectiveness of current high prices in improving offerings of tonnages.

The constantly increasing pressure of freight rates has alarmed zinc producers in view of the larger proportion of domestic zinc production in the Far West, far from the consuming market. Figures of the Bureau of Mines indicate that in 1948 57.6 pct of the tonnage of recoverable zinc from domestic mine production originated in the Far Western states. In 1939, only 29.3 pct of the nation's zinc production came from the Far West. At the same time, the consumption of zinc by industry in the Far West represents only 3 pct of the national total.

This development has made the heavier freight rates of the last few years a matter of growing concern to producers. The industry has taken steps before the Interstate Commerce Committee to limit the effects of further rate increases on shipments of concentrates. As the result of the hearings on the most recent freight

Freight Rates Worrying Zinc Producers; Lead Users Trim Inventories

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rate increase the increases on zinc and lead concentrates were limited to 1½¢ per 100 lb, considerably lower than the general increases of 30 pct in the East, 25 pct in the South and 20 pct in the West. Continued representation will be maintained by the industry at subsequent hearings on the pending increase.

A complete change has taken place in the attitude of consumers to the lead market. Consumers have reduced their working inventories to the barest minimum expecting a downward price movement. Only 2 months ago, shortages of available tonnages encouraged some consumers to buy lead in the gray market, paying as much as 24¢ for secondary and imported metal. At present there are no known purchases being made at above market levels. The principal cause of the changed market psychology has been the mild winter in the East which caused a sharp downtrend in replacement battery sales in that area.

Producers believe that there can be no early price reduction in the lead market without suffering the loss of foreign concentrates on which the market is dependent to the extent of 15,000 to 20,000 tons of refined lead a month. Producers say that the state of con-

sumers' inventories is now so low that they are being constantly requested for early deliveries in order to keep plants in production. They report that current replenishment of working inventories alone should constitute heavy tonnage business.

The zinc market is at present in the shortest supply, copper having relinquished this position in the past few weeks. Galvanizing demand is unusually heavy. Brass mill demand for zinc is very high despite a marked decline in the industry's order position. Die casting requirements for zinc are lighter but, in view of the relatively small tonnage production of Special High Grade, there is believed to be no immediate prospect for an important easing in the market.

There are still shortages of copper to meet all requirements of consumers. However, there has been some change in consumers' pressure for deliveries. Copper producers are as yet uncertain whether this represents more general knowledge of the basic causes of the shortage, or a real change in the pattern of demand. The Bingham, Utah mine strike is still in effect.

Brass mill demand for copper has been reduced in recent weeks. The mills are still seeking heavy tonnages of shapes, principally billets for tube mills. Wire mill demand is still very heavy and any slackening in brass mill requirements is more than compensated for by wire mill operations.

The ingot markets are still largely inactive. As the result, aluminum ingot makers reduced their prices last week ½¢ per lb on low copper grades and ¾¢ on other grades. The Ingot Brass and Bronze Industry reports a December shipment tonnage of 20,954 tons, lower than any month this year except July, only 500 tons less. Total shipments in 1948 were 279,500 tons, 16,000 tons higher than in 1947.

Nonferrous Metals Prices

	Jan. 19	Jan. 20	Jan. 21	Jan. 22	Jan. 24	Jan. 25
Copper, electro, Conn.	23.50	23.50	23.50	23.50	23.50	23.50
Copper, Lake, Conn.	23.625	23.625	23.625	23.625	23.625	23.625
Tin, Straits, New York	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis	17.50	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis	21.30	21.30	21.30	21.30	21.30	21.30

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	38.50
Beryllium copper, 3.75-4.25% Be	
dollars per lb contained Be	\$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$52.00
Cadmium, del'd	\$2.00
Cobalt, 97-99% (per lb)	\$1.65 to \$1.72
Copper electro, Conn. Valley	23.50
Copper, lake, Conn. Valley	23.525
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$110 to \$115
Lead, St. Louis	21.30
Lead, New York	21.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	\$90 to \$92
Nickel, electro, f.o.b. New York	42.90
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$89 to \$93
Silver, New York, cents per troy oz.	70.00
Tin, Grade A, New York	\$1.03
Zinc, East St. Louis	17.50
Zinc, New York	18.198
Zirconium copper, 10-12 pct Zr, per lb contained Zr	\$12.00

Remelted Metals

Brass Ingot

(Published prices, cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	20.00*
No. 120	19.50*
No. 123	19.00*
80-10-10 ingot	
No. 305	27.25
No. 315	24.25
88-10-2 ingot	
No. 210	33.00
No. 215	31.00
No. 245	23.75*
Yellow ingot	
No. 405	17.00*
Manganese bronze	
No. 421	23.00
* F.o.b. Philadelphia	

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

96-5 aluminum-silicon alloys	
0.30 copper, max.	29.00-29.50
0.60 copper, max.	28.75-29.25
Piston alloys (No. 122 type)	24.75-25.25
No. 12 aluminum (No. 2 grade)	24.25-24.75
108 alloy	24.75-25.25
195 alloy	24.75-25.25
13 alloy	28.75-29.25
AXS-679	24.75-25.25

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95 pct-95½ pct	26.25-26.75
Grade 2—92 pct-95 pct	25.00-25.50
Grade 3—90 pct-92 pct	24.00-24.50
Grade 4—85 pct-90 pct	23.25-23.75

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	40½
Electrodeposited	34½
Rolled, oval, straight, delivered	37.34
Ball anodes	38½
Brass, 80-20	
Cast, oval, 15 in. or longer	35½
Zinc, oval, 99.99	
Ball anodes	20.50
Nickel 99 pct plus	
Cast	69.00
Rolled, depolarized	60.00
Cadmium	\$2.10
Silver 999 fine, rolled, 100 oz. lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46.00
Copper sulfate, 99.5 crystals, bbls.	9.10
Nickel salts, single or double, 100 lb bags, frt. allowed	20.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz. lots, per oz.	59
Sodium cyanide, 96 pct domestic 100 lb drums	16.00
Zinc sulfate, crystals, 23.5 pct, bags	
Zinc sulfate, 25 pct, granules, bbls, frt. allowed	

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.031 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: ¼ in. and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4; 35.1¢ to 66¢; 11 to 13, 36.1¢ to 78¢; 23 to 25, 38.2¢ to \$1.07; 35 to 37, 46.7¢ to \$1.65; 47 to 49, 67.5¢ to \$2.41.

Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3.5 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Drawn, ¼ to 11/32 in., 11S-T3, R317-T4, 49¢ to 38¢; cold-finished, ¾ to 1½ in., 11S-T3, 37.5¢ to 35.5¢; ¾ to 2 in., R317-T4, 37.5¢ to 34.5¢; rolled, 1 9/16 to 3 in., 11S-T3, 35.5¢ to 32.5¢; 2½ to 3½ in., R317-T4, 33.5¢ to 32.5¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.: 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed Base quantity 30,000 lb)

Sheet and Plate: Ma, FSA, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-1.01; 22, \$1.22-\$1.31; 24, \$1.62-\$1.75. Specification grade higher.

Extruded Round Rod: M, diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 48¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft. per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft. per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft. per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft. per. up to 19.5 in., 44¢; 4 to 6 lb per ft. per. up to 28 in., 45¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.057, ¼ to 5/16, \$1.14; 5/16 to ¾, \$1.02; ¾ to ¾, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, ¾ to 7/16, 85¢; ¾ to ¾, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, ¾ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blanks		40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	36.78		37.18
Copper, hot-rolled		33.03	
Copper, drawn		34.28	
Low brass	38.57*	35.35	35.66
Yellow brass	37.60*	34.28	34.59
Red brass	38.92*	35.70	36.01
Naval brass	34.90	33.65	39.59
Leaded brass		29.24	
Commercial bronze	39.54*	36.57	36.88
Manganese bronze	38.49	36.99	48.09
Phosphor bronze, 5 pct	57.80*	56.30	56.05
Muntz metal	34.47	33.22	37.66
Everdur, Herculo, Olympic, etc.	40.49	40.76	41.82
Nickel silver			
10 pct		47.17	44.77
Architectural bronze	33.42		
* Seamless tubing.			

Scrap Metals

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 lb or more)

	Heavy	Turn-inge
Copper	21½	20½
Yellow brass	18½	18½
Red brass	20	19½
Commercial bronze	20½	19½
Manganese bronze	18½	17½
Leaded brass rod ends	18½	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery.)

No. 1 copper wire	20.50
No. 2 copper wire	19.50
Light copper	18.50
Refinery brass	18.25-18.50

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer.)

No. 1 copper, wire	19.75
No. 2 copper, wire	18.75
Light copper	17.75
No. 1 composition	15.50
No. 1 comp. turnings	15.25
Rolled brass	12.75-13.25
Brass pipe	13.25-13.75
Radiators	13.75-14.00
Heavy yellow brass	12.00-12.25

Aluminum

Mixed old cast	15.50-15.75
Mixed old clips	15.75-16.00
Mixed turnings, dry	14.50-14.75
Pots and pans	15.75-16.00
Low copper	19.00-19.50

Dealers' Scrap

(Dealer's buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	18½-19
No. 2 heavy copper and wire	17½-18
Light copper	16½-17
Auto radiators (unsweated)	11½-11¾
No. 1 composition	13½-13¾
No. 1 composition turnings	13½-14
Clean red car boxes	11-11½
Cocks and faucets	8-8½
Mixed heavy yellow brass	10½-11
Old rolled brass	12-12½
Brass pipe	15-15½
New soft brass clippings	13-13½
Brass rod ends	12½-13
No. 1 brass rod turnings	12½-13

Aluminum

Alum. pistons and struts	7½-8
Aluminum crankcases	11½-12
2S aluminum clippings	15½-16
Old sheet & utensils	11½-12
Borings and turnings	6½-6
Misc. cast aluminum	11½-12
Dural clips (24S)	11½-12

Zinc

New zinc clippings	10½-11
Old zinc	9-9½
Zinc routings	5½-5¾
Old die cast scrap	5½-6½

Nickel and Monel

Pure nickel clippings	23-23
Clean nickel turnings	17-18
Nickel anodes	23-23
Nickel rod ends	21-22
New Monel clippings	15½-16½
Clean Monel turnings	11-12
Old sheet Monel	13-14
Old Monel castings	10-11
Inconel clippings	13-13
Nickel silver clippings, mixed	8-8½
Nickel silver turnings, mixed	7-7½

Lead

Soft scrap lead	18-18½
Battery plates (dry)	10½-10¾

Magnesium Alloys

Segregated solids	8-8
Castings	4½-5½

Miscellaneous

Block tin	82-84
No. 1 pewter	65-67
No. 1 auto babbitt	51-53
Mixed common babbitt	19-19½
Solder joints	21½-22½
Siphon tops	50-52
Small foundry type	20½-21
Monotype	19-19½
Lino. and stereotype	17½-18
Electrotype	15½-16
New type shell cuttings	6½-7
Hand picked type shells	10½-11
Lino. and stereo dross	7-7½
Electro dross	7-7½

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Weakness in All Grades Continues

New York

••• The downward trend in prices has been slowed, but not arrested. In some areas price changes are few because activity is at a virtual standstill. In other areas prices have slipped substantially, but substantial sales are still hard to find. Nowhere are consumers jumping into the market on a big scale.

A drop of \$1 a ton in No. 1 heavy melting steel in Philadelphia caused THE IRON AGE scrap composite price to ease off to \$40.58 a gross ton. In addition to the general downward trend in prices, another trend is evident. That is the appearance of price differentials between No. 1 and No. 2 heavy melting steel in areas where these grades had previously been quoted at the same figure. Cast grades continued their wobbly plight.

Consumers definitely are not rushing into the market to take advantage of the lower prices. Exactly the opposite is true. Many in the trade do not expect a marked degree of activity until some comfortable stockpiles have eased off a bit. This will take longer in some areas than in others. Meanwhile, consumers hope for still lower prices, while dealers hope for business.

PITTSBURGH—Purchase of several thousand tons of heavy melting steel scrap by one of the mills here this week under the designation of No. 2 heavy melting at \$2 under previously quoted prices has established a differential between No. 1 and No. 2 steel in this market. Although doing so weakly, the No. 1 price of \$41 still stands. Cast grades continue very weak. They are down generally \$5 a ton. Even these prices are nominal in a market devoid of sales. Railroad lists close later this week. But there is sufficient justification to show a drop here of \$1 a ton. Mills are still out of the market on heavy melting except for the recent purchase of No. 2, and little hope for any activity is seen until next month.

CHICAGO—As was expected, Carnegie-Illinois Steel Co., last week lowered their earmarked buying price to \$40. This company is not buying any dealer scrap. They plan to buy practically nothing before the end of February. Other mills are equally comfortable. Inland and Republic are

doing a little meager buying. Youngstown Sheet & Tube Co. remains out of the market. Dealers are selling to brokers at prices ranging from \$35 to \$36.50. The brokers are shipping against \$37, \$38, \$39 or \$40 orders, thus making larger commissions than they previously made. These tonnages, however, are extremely limited. Railroad specialties are still weak and may slip further.

PHILADELPHIA—Consumers of all grades of scrap are staying out of the market, expecting further price drops. Dealers can't book orders for the usual 30 days. Business placed to fill old orders requires car numbers be reported. Cast grades have lost the most ground. But No. 1 melting has been sold at \$1 less. No. 2 bundles cannot be moved and dealers report a spread between this grade and No. 2 melting. Cast iron carwheels were bought on a recent railroad list at more than \$60. Pipe foundries remain out of the market. One consumer has placed an order for chemical borings for delivery at \$37.50, well below the previous market. Lower prices have not been registered in some grades because market operations have not suggested new price levels. Dealers and brokers are actively trying to develop business in these and other grades.

CLEVELAND—Much talk and little buying here and in the Valley is the result of both buyers and brokers efforts to find out where the market is. On appraisal there is now a difference between No. 1 and No. 2 steel scrap. The market this week is based on realistic offers by brokers. In general the market is weaker, but good quality material, particularly low phos, is holding up. On the other hand, it was reported that a Valley consumer turned down some railroad-allocated material.

DETROIT—The price of openhearth scrap dropped \$4 per ton on the eve of negotiating new contracts for February. New sales this week were practically non-existent, rejections were high and in at least one instance the price of earmarked scrap was cut. The only unanswered question seemed to be how far the price would fall before new orders are placed, although there are definite indications that the mills do not want a run-away market. Turnings have been carried down further with the latest price dip. The drop in cast grades of \$5 per ton does not fully reflect, according to some sources, the weakness in the present cast market which finds pig iron in fair supply again, and many Detroit foundries well fixed for scrap and working only 2 or 3 days per week.

CINCINNATI—Mills and foundries in this area are out of the market for the time being. Some buying is expected be-

fore the end of the month, however, and probably at prices not substantially below present levels. Shipments are very good, and Newport is holding up on shipments at the present time. Cast grades are very weak and the trade is fumbling around trying to find the price at which foundries will come in.

NEW YORK—Activity is almost at a standstill in this market. Some scrap is still moving, but nearly all of it is on old orders. New orders are practically non-existent. No. 2 heavy melting and No. 2 bundles slipped another half dollar but got little action, even at the lower price. Machinery cast skidded another \$2. Other cast items were off about \$1, except for clean cast chemical borings which reappeared \$2.50 a ton lower. There is no strength in this market. All grades remain shaky at present quotations.

BOSTON—Still recovering from last week's blow which sent prices down about \$2 all along the line, the scrap market here slowed down with everybody waiting to see what will happen next. There was no mistake about a cautious attitude, with buyers and sellers on the sidelines. No. 1 heavy melting remained at its new low price of \$34.40.

BIRMINGHAM—Very little trading is being carried on in this market. Republic Steel Corp., largest consumer of openhearth scrap in the Birmingham area, was placing no orders at the beginning of the week and pipe shops and foundries remained out of the market. The undertone was weaker on all grades. No material was reported moving out of this district to northern mills.

BUFFALO—Upper crust scrap was cropped deeply during the last week. Mixed cast was cut \$5 to \$50 to \$52. Small sales were reported at \$52 and brokers covered at the lower figure. Scrap rail plunged \$8 to \$50 on a total lack of demand. No. 1 heavy melting was reduced \$1 to \$2 to \$43 to \$45 without a trace of new business. In fact there were reports of yards not even bothering to segregate their No. 1, letting it go along with No. 2 as delivery on openhearth contracts. No. 2 steel was unchanged at \$39 to \$40. A sale to a leading consumer was reported at \$39.75, although the tonnage was not large and it was doubted that it could be repeated. One of the big mills was reported releasing steel customers from earmarking commitments, thereby helping to increase open market supplies.

ST. LOUIS—The scrap market continued its downward course, prices being off on some items from \$1 to \$3 a ton. Steel mills and foundries seem more concerned with reducing inventories rather than buying. Inclement weather has retarded the movement of supplies to this market. Railroad lists; Texas & Pacific, 1000 tons and International-Great Northern, 1500 tons.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$40.50 to \$41.00
RR. hvy. melting	43.50 to 44.00
No. 2 hvy. melting	38.50 to 39.00
RR. scrap rails	55.00 to 56.00
Rails 2 ft and under	58.00 to 59.00
No. 1 comp'd bundles	40.50 to 41.00
Hand bldd. new shts.	40.50 to 41.00
Hvy. axle turn.	42.00 to 43.00
Hvy. steel forge turn.	42.00 to 43.00
Mach. shop turn.	34.00 to 35.00
Shoveling turn.	36.00 to 37.00
Mixed bor. and turn.	34.00 to 35.00
Cast iron borings	37.00 to 38.00
No. 1 mach. cast	58.50 to 59.50
Mixed yard cast	54.50 to 55.00
Hvy. breakable cast	50.00 to 51.00
Malleable	64.00 to 65.00
RR. knuck. and cup.	53.00 to 54.00
RR. coil springs	53.00 to 54.00
RR. leaf springs	53.00 to 54.00
Rolled steel wheels	53.00 to 54.00
Low phos.	46.00 to 47.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 bundles	39.00 to 40.00
No. 2 dealers' bundles	37.00 to 38.00
Bundled mach. shop turn.	36.00 to 37.00
Galv. bundles	35.00 to 36.00
Mach. shop turn.	32.00 to 33.00
Short shov. turn.	34.00 to 35.00
Cast iron borings	33.00 to 34.00
Mix. borings and turn.	32.00 to 33.00
Los phos. hvy. forge	46.00 to 46.50
Los phos. plates	42.50 to 44.50
No. 1 RR. hvy. melt.	41.00 to 42.50
Rerolling rails	56.00 to 57.00
Miscellaneous rails	46.00 to 47.00
Angles & splice bars	48.00 to 50.00
Locomotive tires, cut	48.00 to 50.00
Cut bolster & side frames	46.00 to 48.00
Standard stl. car axles	65.00 to 67.00
No. 3 steel wheels	47.00 to 48.00
Couplers and knuckles	47.00 to 48.00
Rails, 2 ft and under	51.00 to 52.00
Malleable	60.00 to 62.00
No. 1 mach. cast	52.00 to 55.00
No. 1 agricul. cast	50.00 to 54.00
Heavy breakable cast.	56.00 to 57.00
RR. grate bars	53.00 to 54.00
Cast iron brake shoes	55.00 to 56.00
Cast iron car wheels	56.00 to 59.00

CINCINNATI

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	\$36.00 to \$36.50
No. 2 hvy. melting	36.00 to 36.50
No. 1 bundles	36.00 to 36.50
No. 2 bundles	36.00 to 36.50
Mach. shop turn.	31.00 to 31.50
Shoveling turn.	33.00 to 33.50
Cast iron borings	32.00 to 32.50
Mixed bor. & turn.	32.00 to 32.50
Low phos. 18 in. under	45.00 to 46.00
No. 1 cupola cast.	53.00 to 55.00
Hvy. breakable cast.	44.00 to 46.00
Rails 18 in. and under	54.00 to 56.00
Rails random length	46.00 to 48.00
Drop broken	55.50 to 57.50

BOSTON

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$34.40
No. 2 hvy. melting	32.00
Nos. 1 and 2 bundles	32.00
Bushelings	32.00
Shoveling turn.	\$28.00 to 29.00
Machine shop turn.	26.00 to 27.00
Mixed bor. and turn.	26.00 to 27.00
C'n cast chem. bor.	33.50 to 34.50
No. 1 machinery cast.	59.00 to 60.00
No. 2 machinery cast.	51.00 to 52.00
Heavy breakable cast.	50.50
Stove plate	50.00

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 bundles	33.00 to 34.00
New busheling	33.00 to 34.00
Flashings	33.00 to 34.00
Mach. shop turn.	26.00 to 27.00
Machinery cast	53.00 to 55.00
Mixed yard cast	48.00 to 50.00
Shoveling turn.	27.00 to 28.00
Cast iron borings	29.00 to 30.00
Mixed bor. & turn.	26.00 to 27.00
Low phos. plate	38.00 to 39.00
Heavy breakable cast.	45.00 to 48.00
Stove plate	50.00 to 53.00
Automotive cast.	53.00 to 55.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$41.00 to \$42.00
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	41.00 to 42.00
No. 2 bundles	38.00 to 38.50
Mach. shop turn.	34.00 to 34.50
Shoveling turn.	35.00 to 35.50
Mixed bor. and turn.	34.00 to 34.50
Clean cast chemical bor.	35.50 to 37.50
No. 1 machinery cast	50.00 to 52.00
No. 1 mixed yard cast.	46.00 to 48.00
Hvy. breakable cast.	47.00 to 49.00
Hvy. axle forge turn.	41.00 to 42.00
Low phos. acid, openhearth.	45.00 to 46.00
Low phos., electric furnace	47.00 to 48.00
Low phos. bundles	45.00 to 46.00
RR. steel wheels	50.00 to 51.00
RR. coil springs	50.00 to 51.00
RR. malleable	70.00 to 72.00
Cast iron carwheels	60.00 to 61.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	36.00 to 37.00
Bundled sheets	35.00 to 36.00
Mach. shop turn.	25.00 to 26.00
Shoveling turnings	28.00 to 30.00
Locomotive tires, uncut	40.00 to 41.00
Mis. std. sec. rails	45.00 to 46.00
Steel angle bars	47.00 to 49.00
Rails 3 ft and under	50.00 to 52.00
RR. steel springs	44.00 to 45.00
Steel car axles	65.00 to 66.00
Brake shoes	45.00 to 46.00
Malleable	63.00 to 65.00
Cast iron car wheels	58.00 to 59.00
No. 1 machinery cast.	53.00 to 60.00
Hvy. breakable cast.	56.00 to 57.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$35.00
No. 2 hvy. melting	35.00
No. 2 bundles	35.00
No. 1 busheling	35.00
Long turnings	\$30.00 to 32.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	29.50
Bar crops and plate	38.00 to 40.00
Structural and plate	38.00 to 40.00
No. 1 cupola cast.	60.00 to 62.00
Stove plate	60.00 to 61.00
No. 1 RR. hvy. melt.	36.00
Steel axles	60.00 to 62.00
Scrap rails	42.00 to 44.00
Rerolling rails	55.00 to 58.00
Angles & splice bars	40.00 to 42.00
Rails 3 ft & under	40.00 to 42.00
Cast iron carwheels	61.00 to 63.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$38.50 to \$39.00
No. 2 hvy. melting	38.50 to 39.00
No. 2 bundles	38.50 to 39.00
Mach. shop turn.	34.00 to 35.00
Short shov. turn.	36.00 to 36.50
Cast iron borings	35.00 to 35.50
Low phos.	46.00 to 48.00

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$36.00 to \$37.50
No. 2 hvy. melting	33.50 to 34.50
No. 2 bundles	33.50 to 34.50
Mach. shop turn.	28.00 to 29.50
Mixed bor. & turn.	28.00 to 29.50
Shoveling turnings	30.00 to 31.50
Machinery cast.	51.00 to 53.00
Mixed yard cast.	49.00 to 50.50
Heavy breakable cast.	46.50 to 48.00
Charging box cast.	46.50 to 48.00
Unstrp. motor blks.	44.50 to 46.00
C'n cast chem. bor.	34.00 to 35.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$43.00 to \$45.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	39.00 to 40.00
No. 1 busheling	39.00 to 40.00
Mach. shop turn.	34.75 to 35.25
Shoveling turn.	36.75 to 37.25
Cast iron borings	35.75 to 36.25
Mixed bor. and turn.	34.75 to 35.25
Clean auto. cast.	59.00 to 60.00
Mixed yard cast.	50.00 to 52.00
Stove plate	50.00 to 52.00
RR. malleable	70.00 to 75.00
Small indus. malleable	44.00 to 45.00
Low phos. plate	44.00 to 46.00
Scrap rails	50.00
Rails 3 ft & under	56.00 to 57.00
RR. steel wheels	53.00 to 54.00
RR. coil & leaf spgs.	54.25
RR. knuckles & coup.	54.25

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$39.50 to \$40.00
No. 2 hvy. melting	37.50 to 38.00
No. 1 bundles	39.50 to 40.00
No. 1 busheling	37.50 to 38.00
Drop forge flashings	37.50 to 38.00
Mach. shop turn.	32.50 to 33.00
Shoveling turn.	34.50 to 35.00
Steel axle turn.	37.50 to 38.00
Cast iron borings	33.50 to 34.00
Mixed bor. & turn.	33.50 to 34.00
Low phos. 2 ft and under	44.50 to 45.00
No. 1 machinery cast.	61.00 to 63.00
Malleable	70.00 to 71.00
RR. cast.	69.00 to 70.00
Railroad grate bars	55.00 to 56.00
Stove plate	58.00 to 59.00
RR. hvy. melting	43.00 to 43.50
Rails 3 ft and under	57.00 to 58.00
Rails 18 in. and under	59.00 to 60.00

SAN FRANCISCO

Per gross ton, f.o.b. shipping point:

No. 1 hvy. melting	\$27.50
No. 2 hvy. melting	27.50
No. 2 bales	27.50
No. 3 bales	24.50
Mach. shop turn.	18.00
Elec. fur. 1 ft under	\$40.00 to 42.00
No. 1 cupola cast.	40.00 to 42.00
RR. hvy. melting	28.50
Rails	29.00

LOS ANGELES

Per gross ton, f.o.b. shipping point:

No. 1 hvy. melting	\$27.50
No. 2 hvy. melting	27.50
No. 1 bales	27.50
No. 2 bales	27.50
No. 3 bales	24.50
Mach. shop turn.	20.00
Elec. fur. 1 ft under	\$40.00 to 42.00
No. 1 cupola cast.	40.00 to 50.00
RR. hvy. melting	28.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	\$30.00 to \$33.50
Elec. fur. 1 ft and under	36.50 to 40.00
No. 1 cupola cast.	40.00 to 40.50
RR. hvy. melting	30.00 to 32.50

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point:

Heavy melting	\$23.00*
No. 1 bundles	23.00*
No. 2 bundles	22.50*
Mechanical bundles	21.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, rerolling	26.00*
Bushelings	17.50*
Bushelings, new fact, prop'd	21.00*
Bushelings, new fact, unprop'd	16.00*
Short steel turnings	17.00*
No. 1 cast	\$48.00 to 50.00*
No. 2 cast	44.00 to 45.00*

*Ceiling Price

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices . .

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Jan. 25, 1949	Jan. 18, 1949	Dec. 28, 1948	Jan. 27, 1948
(cents per pound)	1949	1949	1948	1948
Hot-rolled sheets	3.26	3.26	3.26	2.80
Cold-rolled sheets	4.00	4.00	4.00	3.55
Galvanized sheets (10 ga)	4.40	4.40	4.40	3.95
Hot-rolled strip	3.265	3.265	3.265	2.80
Cold-rolled strip	4.063	4.063	4.063	3.55
Plates	3.42	3.42	3.42	2.95
Plates wrought iron	7.85	7.85	7.85	6.85
Stains C-R strip (No. 302)	33.25	33.25	33.25	30.50

Tin and Terneplate:	Jan. 25, 1949	Jan. 18, 1949	Dec. 28, 1948	Jan. 27, 1948
(dollars per base box)				
Tinplate (1.50 lb) cokes	\$7.75	\$7.75	\$6.80	\$6.80
Tinplate, electro (0.50 lb)	6.70	6.70	6.00	6.00
Special coated mfg. ternes	6.65	6.65	5.90	5.90

Bars and Shapes:	Jan. 25, 1949	Jan. 18, 1949	Dec. 28, 1948	Jan. 27, 1948
(cents per pound)				
Merchant bars	3.37	3.37	3.37	2.90
Cold-finished bars	3.995	3.995	3.995	3.55
Alloy bars	3.75	3.75	3.75	3.30
Structural shapes	3.25	3.25	3.25	2.80
Stainless bars (No. 302)	28.50	28.50	28.50	26.00
Wrought iron bars	9.50	9.50	9.50	7.15

Wire:	Jan. 25, 1949	Jan. 18, 1949	Dec. 28, 1948	Jan. 27, 1948
(cents per pound)				
Bright wire	4.256	4.256	4.256	3.55

Rails:	Jan. 25, 1949	Jan. 18, 1949	Dec. 28, 1948	Jan. 27, 1948
(dollars per 100 lb)				
Heavy rails	\$3.20	\$3.20	\$3.20	\$2.75
Light rails	3.55	3.55	3.55	3.10

Semifinished Steel:	Jan. 25, 1949	Jan. 18, 1949	Dec. 28, 1948	Jan. 27, 1948
(dollars per net ton)				
Rerolling billets	\$52.00	\$52.00	\$52.00	\$45.00†
Slabs, rerolling	52.00	52.00	52.00	45.00†
Forging billets	61.00	61.00	61.00	55.00†
Alloy blooms, billets, slabs	63.00	63.00	63.00	66.00†

Wire rod and Skelp:	Jan. 25, 1949	Jan. 18, 1949	Dec. 28, 1948	Jan. 27, 1948
(cents per pound)				
Wire rods	3.619	3.619	3.619	2.80
Skelp	3.25	3.25	3.25	2.60

† Gross ton

Pig Iron:	Jan. 25, 1949	Jan. 18, 1949	Dec. 28, 1948	Jan. 27, 1948
(per gross ton)				
No. 2, foundry, Phila.	\$51.56	\$51.56	\$51.56	\$44.61
No. 2, Valley furnace	46.50	46.50	46.50	39.50
No. 2, Southern Cin'ti	49.46	49.46	49.47	43.28
No. 2, Birmingham	43.38	43.38	43.38	37.38
No. 2, foundry, Chicago†	46.50**	46.50**	46.50**	39.99
Basic del'd Philadelphia*	50.76	50.76	50.76	44.11
Basic, Valley furnace	46.00	46.00	46.00	39.00
Malleable, Chicago†	46.50	46.50	46.50	39.50
Malleable, Valley	46.50	46.50	46.50	39.50
Charcoal, Chicago	73.78	73.78	73.78	62.46
Ferromanganese‡	161.71	161.71	161.71	145.00

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡ Average of U. S. prices quoted on Ferroalloy page.

* Does not include interim increase on total freight charges, effective Jan. 11, 1949.

** Corrected.

Scrap	Jan. 25, 1949	Jan. 18, 1949	Dec. 28, 1948	Jan. 27, 1948
(per gross ton)				
Heavy melt'g steel, P'gh.	\$40.75	\$40.75	\$42.75	\$40.50
Heavy melt'g steel, Phila.	41.50	42.50	44.50	42.50
Heavy melt'g steel, Ch'go	39.50	39.50	41.75	39.50
No. 1, hy. comp. sh't, Det.	33.50	38.00	38.00	35.50
Low phos. Young'n.	47.00	47.00	47.75	47.75
No. 1, cast, Pittsburgh	59.00	64.00	69.00	56.75
No. 1, cast, Philadelphia	51.00	57.00	65.50	59.00
No. 1, cast, Chicago	53.50	53.50	68.50	69.50

Coke, Connellsville:	Jan. 25, 1949	Jan. 18, 1949	Dec. 28, 1948	Jan. 27, 1948
(per net ton at oven)				
Furnace coke, prompt	\$15.25	\$17.00	\$15.00	\$12.50
Foundry coke, prompt	16.75	17.00	17.00	14.00

Nonferrous Metals:	Jan. 25, 1949	Jan. 18, 1949	Dec. 28, 1948	Jan. 27, 1948
(cents per pound to large buyers)				
Copper, electro, Conn.	23.50	23.50	23.50	21.50
Copper, Lake Conn.	23.625	23.625	23.625	21.625
Tin, Grade A, New York	\$1.03	\$1.03	\$1.03	94.00
Zinc, East St. Louis	17.50	17.50	17.50	12.00
Lead, St. Louis	21.30	21.30	21.30	14.80
Aluminum, virgin	17.00	17.00	17.00	15.00
Nickel, electrolytic	42.90	42.90	42.90	36.56
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	38.50	38.50	38.50	33.00

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

Composite Prices . .

FINISHED STEEL (Base Price)

Jan. 25, 1949	3.75628¢ per lb.
One week ago	3.75628¢ per lb.
One month ago	3.75628¢ per lb.
One year ago	3.22566¢ per lb.

PIG IRON

.....	\$46.82 per gross ton
.....	\$46.87 per gross ton
.....	\$46.91 per gross ton
.....	\$40.17 per gross ton

SCRAP STEEL

.....	\$40.58 per gross ton
.....	\$40.92 per gross ton
.....	\$43.00 per gross ton
.....	\$40.83 per gross ton

HIGH		LOW	
1949....	3.75628¢ Jan. 1	3.75628¢ Jan. 1	
1948....	3.75700¢ July 27	3.22566¢ Jan. 1	
1947....	3.19541¢ Oct. 7	2.87118¢ Jan. 7	
1946....	2.83599¢ Dec. 31	2.54490¢ Jan. 1	
1945....	2.44104¢ Oct. 2	2.54490¢ Jan. 2	
1944....	2.30837¢ Sept. 5	2.21189¢ Oct. 5	
1943....	2.29176¢	2.29176¢	
1942....	2.28249¢	2.28249¢	
1941....	2.43078¢	2.43078¢	
1940....	2.30467¢ Jan. 2	2.24107¢ Apr. 16	
1939....	2.35367¢ Jan. 3	2.26689¢ May 16	
1938....	2.58414¢ Jan. 4	2.27207¢ Oct. 18	
1937....	2.58414¢ Mar. 9	2.32263¢ Jan. 4	
1936....	2.32263¢ Dec. 28	2.05200¢ Mar. 10	
1935....	2.07642¢ Oct. 1	2.06492¢ Jan. 8	
1934....	2.15367¢ Apr. 24	1.95757¢ Jan. 2	
1933....	1.95578¢ Oct. 3	1.75836¢ May 2	
1932....	1.89196¢ July 5	1.83901¢ Mar. 1	
1931....	1.99626¢ Jan. 13	1.86586¢ Dec. 29	
1929....	2.31773¢ May 28	2.26498¢ Oct. 29	

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

HIGH		LOW	
46.87 Jan. 18	46.82 Jan. 25		
46.91 Oct. 12	39.58 Jan. 6		
37.98 Dec. 30	30.14 Jan. 7		
30.14 Dec. 10	25.37 Jan. 1		
25.37 Oct. 23	23.61 Jan. 2		
\$23.61	\$23.61		
23.61	23.61		
23.61	23.61		
\$23.61 Mar. 20	\$23.45 Jan. 2		
23.45 Dec. 23	22.61 Jan. 2		
22.61 Sept. 19	20.61 Sept. 12		
23.25 June 21	19.61 July 6		
23.25 Mar. 9	20.25 Feb. 16		
19.74 Nov. 24	18.73 Aug. 11		
18.84 Nov. 5	17.83 May 14		
17.90 May 1	16.90 Jan. 27		
16.90 Dec. 5	13.56 Jan. 3		
14.81 Jan. 5	13.56 Dec. 6		
15.90 Jan. 6	14.79 Dec. 15		
18.71 May 14	18.21 Dec. 17		

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

HIGH		LOW	
\$43.00 Jan. 1	\$40.58 Jan. 25		
43.16 July 27	39.75 Mar. 9		
42.58 Oct. 23	29.50 May 20		
31.17 Dec. 24	19.17 Jan. 1		
19.17 Jan. 2	18.92 May 22		
19.17 Jan. 11	15.76 Oct. 24		
\$19.17	\$19.17		
19.17	19.17		
\$22.00 Jan. 7	\$19.17 Apr. 10		
21.83 Dec. 30	16.04 Apr. 9		
22.50 Oct. 3	14.08 May 16		
15.00 Nov. 22	11.00 June 7		
21.92 Mar. 30	12.67 June 9		
17.75 Dec. 21	12.67 June 8		
13.42 Dec. 10	10.33 Apr. 29		
13.00 Mar. 13	9.50 Sept. 25		
12.25 Aug. 8	6.75 Jan. 3		
8.50 Jan. 12	6.43 July 5		
11.33 Jan. 6	8.50 Dec. 29		
17.58 Jan. 29	14.08 Dec. 8		

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Commercial quality sheet grade; prices, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 25¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb and over. (9) Carload lot in manufacturing trade. (10) Hollowware enameling, gages 29 to 31 only. (11) Produced to dimensional tolerances in AISI Manual Sec. 6. (12) Slab prices subject to negotiation in most cases. (13) San Francisco only. (14) Los Angeles only. (15) San Francisco and Los Angeles only. (16) Seattle only. (17) Seattle and Los Angeles only.

Base prices at producing points apply to the sizes and grades produced in these areas

PRODUCTS	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio		Detroit	Johns- town	Seattle, S. Frisco, Los Angeles	Fontana
INGOTS Carbon forging	\$50.00														
Alloy	\$51.00						(per net ton)								
BILLETS, BLOOMS, SLABS Carbon, re-rolling ¹²	\$52.00				\$52.00	\$52.00	(per net ton)						\$52.00		
Carbon forging billets	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	(per net ton)						\$61.00		
Alloy	\$63.00	\$63.00				\$63.00	(Bethlehem, Canton, Massillon = \$63.00) (per net ton)								
PIPE SKELP	3.25						3.25				Warren = 3.25				
WIRE RODS	3.40 to 4.15	3.40 to 3.90		3.40	3.40		3.65	3.50			Worcester 3.70		3.40	4.05 ¹³ 4.10 ¹⁴	
SHEETS Hot-rolled ⁶	3.25 to 3.30	3.25	3.25	3.25- 3.30	3.25	3.25	3.25	3.25		Warren, Ashland = 3.25		3.45		3.95 ¹⁵	5.65
Cold-rolled ¹	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.70	4.00	Warren 4.00	4.20		Pittsburg, Cal. 4.95	
Galvanized (10 gage)	4.40	4.40	4.40		4.40			4.40	Canton = 4.40	4.40	Ashland = 4.40			5.15 ¹⁵	
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40		4.70			
Long ternes ² (10 gage)	4.80		4.80							4.80					
STRIP Hot-rolled ³	3.25 to 3.30	3.25 to 3.30	3.25	3.25 to 3.30	3.25	3.25	3.25	3.25		3.25	Warren = 3.25	3.45		4.00 to 4.25	5.90
Cold-rolled ⁴	4.00	4.25		4.00		4.00	4.00	4.00		New Haven 4.50 Warren = 4.00 to 4.25		4.20 to 4.50			7.10
TINPLATE Cokes, 1.50 lb. ⁸ base box	\$7.75	\$7.75	\$7.75		\$7.85			\$7.85	\$7.95	Warren, Ohio = \$7.75				Pittsburg, Cal. = \$8.53	
Electrolytic 0.25, 0.50, 0.75 lb. box	Deduct \$1.30, \$1.05 and 75¢ respectively from 1.50 lb. coke base box price														
TERNES MFG., special coated	Deduct \$1.10 from 1.50 lb. coke base box price														
BLACKPLATE CANMAKING 55 to 128 lb.	Deduct \$2.00 from 1.50 lb. coke base box price														
BLACKPLATE, h.e., 29 ga. ¹⁰	5.30	5.30	5.30					5.40		Warren, Ohio = 5.30					
BARS Carbon Steel	3.35 to 3.55	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton = 3.35	3.55	3.35	4.05 to 4.10	5.30
Reinforcing (billet) ⁷	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton = 3.35		3.35	4.05 to 4.10	5.30
Cold-finished ⁹	3.95 to 4.00	4.00	4.00	4.00		4.00	4.00					4.30			
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75		Bethlehem, Canton, Massillon = 3.75			4.05	3.75	4.80 ¹⁴	5.60
Alloy cold-drawn	4.65 to 4.75	4.65	4.65	4.65		4.65	4.65		Massillon = 4.65		Worcester 4.95				
PLATE Carbon steel ¹¹	3.40 to 3.60	3.40	3.40	3.40 to 3.60	3.40	3.45 Cons hochocken	3.40 = 3.95	3.45 Coatesville = 3.75, Geneva = 3.40, Harrisburg = 6.50				3.85	3.45	4.30 ¹⁶	5.80
Floor plates	4.55	4.55		4.55					Cons hochocken = 4.55						
Alloy	4.40	4.40							Coatesville = 5.10						
SHAPES, Structural	3.25 to 3.30	3.25	3.25		3.25	3.30		Bethlehem = 3.30, Geneva, Utah = 3.25					3.30	3.85 to 4.30	5.75
MANUFACTURERS' WIRE ⁵ Bright	4.15 to 4.50	4.15 to 4.65		4.15	4.15		4.15	4.25	Duluth = 4.15, Worcester = 4.45				4.15	5.15 ¹³	
Spring (high carbon)	5.20	5.20		5.20				5.30		Worcester = 5.50 New Haven, Trenton = 5.50			5.20	Duluth = 5.20-6.15	
PILING, Steel sheet	4.05	4.05				4.05									

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	Chromium Nickel						Straight Chromium		
	301	302	303	304	316	347	410	416	430
Ingot, rerolling.....	12.75	13.50	15.00	14.50	22.75	20.00	11.25	13.75	11.50
Slabs, billets, rerolling.....	17.00	18.25	20.25	19.25	30.25	28.75	15.00	18.50	15.25
Forging discs, die blocks, rings.....	30.50	30.50	33.00	32.00	49.00	41.00	24.5	25.00	25.00
Billets, forging.....	24.25- 26.50	24.25- 26.50	26.25- 28.75	25.50- 27.75	39.00- 42.75	32.75- 35.75	19.50- 21.50	20.00- 21.75	20.00- 21.75
Bars, wire, structurals.....	28.50	28.50	31.00	30.00	46.00	38.50	23.00	23.50	23.50
Plates.....	32.00	32.00	34.00	34.00	50.50	44.00	26.00	26.50	26.50
Sheets.....	37.50- 40.75	37.50- 40.75	39.50- 43.00	39.50- 43.00	53.00- 57.25	50.00- 54.00	33.00	33.50	35.50
Strip, hot-rolled.....	24.25	25.75	30.00	27.75	46.00	38.75	21.25	28.00	21.75
Strip, cold-rolled.....	30.50- 30.75	33.00- 33.50	36.50- 39.50	35.00- 35.75	55.00- 57.25	48.50- 50.00	27.00	33.50	27.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
Carbon		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	90.5¢
18	4	1	—	5	\$1.42
18	4	2	—	—	\$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢
High-carbon-chromium..... 52¢					
Oil harden manganese..... 29¢					
Special carbon..... 26.5¢					
Extra carbon..... 22¢					
Regular carbon..... 19¢					
Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.					

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon.....	4.00¢
0.41 to 0.60 carbon.....	5.50¢
0.61 to 0.80 carbon.....	6.10¢
0.81 to 1.05 carbon.....	8.05¢
1.06 to 1.35 carbon.....	10.35¢
Worcester, add 0.30¢.	

CLAD STEEL

Base prices, cents per pound

Stainless clad	Plate	Sheet
No. 304, 20 pct, f.o.b.		
Coatesville, Pa.....	*26.50	
Washington, Pa.....	*26.50	*22.50
Claymont, Del.....	*26.50	
Conshohocken, Pa....		*22.50
Nickel-clad		
10 pct f.o.b. Coatesville, Pa.....		27.50
Inconel-clad		
10 pct, f.o.b. Coatesville.....	36.00	
Monel-clad		
10 pct, f.o.b. Coatesville.....	29.00	
Aluminized steel sheets		
Hot dip, 20 gage, f.o.b. Butler, Pa.....		9.25

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column Pittsburg, Calif.
Standard & coated nails* 103	123
Galvanized nails*..... 103	123
Woven wire fence†..... 109	132
Fence posts, carloads††.. 114	
Single loop bale ties..... 106	130
Galvanized barbed wire** 123	143
Twisted barbed wire... 123	

* Fgh., Chi., Duluth; Worcester, 6 columns higher. † 1½" gage and heavier. ** On 80 rod spools, in carloads. †† Duluth only.

Base per Pittsburg,
100 lb Calif.

Annealed fence wire†... \$4.80	\$5.75
Annealed, galv. fencing†. 5.25	6.20
Cut nails, carloads††.... 6.75	

† Add 30¢ at Worcester; 10¢ at Sparrows Pt.
†† Less 20¢ to jobbers.

ELECTRICAL SHEETS

Base, HR cut lengths, f.o.b. mill

	Cents per lb
Armature.....	5.45
Electrical.....	5.95
Motor.....	6.70 to 9.20
Dynamo.....	7.50 to 10.00
Transformer 72.....	8.05 to 11.80
Transformer 65.....	8.60 to 12.35
Transformer 58.....	9.30 to 13.05
Transformer 52.....	10.10

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb.....	\$3.20†
Joint bars, 100 lb.....	4.25
Light rails (from billets) per 100 lb.....	3.55

Base Price
cents per lb

Track spikes.....	5.35
Axles.....	5.20
Screw spikes.....	8.00
Tie plates.....	4.05
Tie plates, Pittsburg, Calif.*.....	4.20
Track bolts, untreated.....	8.25
Track bolts, heat treated, to railroads.....	8.50
*Seattle, add 30¢.	
CF&I and Inland, \$3.50.	

HIGH STRENGTH, LOW ALLOY STEELS

Mill base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otis- coloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie- Illinois, Republic	Republic	Alan Wood	Inland	Bethle- hem	Jones & Laughlin	Youngs- town Sheet & Tube	Great Lakes Steel
Plates.....	5.20	5.20	5.20	5.30	5.20	5.30	5.20	5.40	5.65
Sheets									
Hot-rolled....	4.95	4.95	4.95	5.25	4.95	4.95	4.95	5.15	5.25
Cold-rolled ..	8.05	6.05	6.05	....	6.05	8.05	8.05	6.25	6.35
Galvanized ..	....	6.75	....	....	....	8.75	....	....	....
Strip									
Hot-rolled....	4.95	4.95	4.95	....	4.95	4.95	4.95	5.15	5.25
Cold-rolled....	....	....	6.05	....	....	8.05	8.05	....	6.35
Shapes.....	....	4.95	....	....	4.95	5.05	4.95	....	....
Beams.....	....	4.95	....	....	....	....	....	....	....
Bars									
Hot-rolled....	5.10	5.10	5.10	....	5.10	5.10	5.10	....	5.40
Bar shapes.....	....	5.10	....	....	5.10	5.10	5.10	....	....

PIPE AND TUBING

Base discounts, f.o.b. mills,
Base price, \$200.00 per net ton.

STANDARD, THREADED AND
COUPLED

Steel, butt weld	Black	Galv.
1/2-in.	43 to 41	20 to 18
3/4-in.	46 to 44	24 to 22
1-in.	48 1/2 to 46 1/2	27 to 25
1 1/4-in.	49 to 47	27 1/2 to 25 1/2
1 1/2-in.	49 1/2 to 47 1/2	28 to 26
2-in.	50 to 48	28 1/2 to 26 1/2
2 1/2 to 3-in.	50 1/2 to 49 1/2	29 to 27
Steel, lap weld		
2-in.	39 1/2	17 1/2
2 1/2 to 3-in.	39 1/2	21 1/2
3 1/2 to 6-in.	46 1/2 to 42	20 1/2 to 24 1/2
Steel, seamless		
2-in.	38 1/2 to 27	16 1/2 to 5
2 1/2 to 3-in.	41 1/2 to 35	19 1/2 to 10 1/2
3 1/2 to 6-in.	43 1/2 to 38 1/2	21 1/2 to 16 1/2
Wrought Iron, butt weld		
1/2-in.	+20 1/2	+52 1/2
3/4-in.	+10 1/2	+41 1/2
1 & 1 1/4-in.	+4 1/2	+32 1/2
2-in.	-1 1/2	+29
3-in.	-2	+28 1/2
Wrought Iron, lap weld		
2-in.	+7 1/2	+36 1/2
2 1/2 to 3 1/2-in.	+5	+32
4-in.	list	+26
4 1/2 to 8-in.	+2	+27 1/2

EXTRA STRONG, PLAIN ENDS

Steel, butt weld		
1/2-in.	42 to 40	20 1/2 to 18 1/2
3/4-in.	46 to 44	24 1/2 to 22 1/2
1-in.	48 to 46	27 1/2 to 25 1/2
1 1/4-in.	48 1/2 to 46 1/2	28 to 26
1 1/2-in.	49 to 47	28 1/2 to 26 1/2
2-in.	49 1/2 to 47 1/2	29 to 27
2 1/2 to 3-in.	50 to 48	29 1/2 to 27 1/2
Steel, lap weld		
2-in.	39 1/2	18 1/2
2 1/2 to 3-in.	44 1/2	23 1/2
3 1/2 to 6-in.	48 to 44	23 to 27
Steel, seamless		
2-in.	37 1/2 to 32 1/2	16 1/2 to 11 1/2
2 1/2 to 3-in.	41 1/2 to 36 1/2	20 1/2 to 15 1/2
3 1/2 to 6-in.	45	24
Wrought Iron, butt weld		
1/2-in.	+16	+46 1/2
3/4-in.	+9 1/2	+39 1/2
1 to 2-in.	-1 1/2	+28 1/2
Wrought Iron, lap weld		
2-in.	+4 1/2	+33
2 1/2 to 4-in.	-5	+21 1/2
4 1/2 to 6-in.	-1	+26

For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut length 4 to 24 ft inclusive.

OD	Gage	Seamless		Electric Weld	
in.	BWG	H.R.	C.R.	H.R.	C.D.
2	13	19.18	22.56	18.60	21.89
2½	12	25.79	30.33	25.02	29.41
3	12	28.68	33.76	27.82	32.74
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	\$106.70
6 to 24-in., del'd N. Y.	103.50 to 108.40
6 to 24-in., Birmingham	93.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	120.30
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less ease lots

Machine and Carriage Bolts

	Pot Off List
1/2 in. & smaller x 6 in. & shorter....	35
9/16 & 5/8 in. x 6 in. & shorter.....	37
3/4 in. & larger x 6 in. & shorter....	34
All diam, longer than 6 in.	30
Lag, all diam over 6 in. longer....	35
Lag, all diam x 6 in. & shorter.....	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

1/2 in. and smaller.....	35
9/16 to 1 in. inclusive	34
1 1/4 to 1 1/2 in. inclusive	32
1 1/2 in. and larger	27
On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.	

Semifinished Hexagon Nuts

	USS	SAE
7/16 in. and smaller	41	
1/2 in. and smaller	38	
1/2 in. through 1 in.	39	
9/16 in. through 1 in.	37	
1 1/4 in. through 1 1/2 in.	35	37
1 1/2 in. and larger	28	
In full case lots, 15 pct additional discount.		

Stove Bolts

Packages, nuts separate	\$61.75
In bulk	70.00

Large Rivets

(1/2 in. and larger)
Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

(7/16 in. and smaller)
Pot off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48
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Cap and Set Screws

(In packages)

	Pot Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	46
3/4 to 1 in. x 6 in., SAE (1035), heat treated	35
Set screws, oval points	
Milled studs	19
Flat head cap screws, listed sizes..	5
Fillister head cap, listed sizes	28

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill.

	Base price per net ton
Effective CaF ₂ Content:	\$37.00
70% or more	37.00
60% or less	34.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	\$7.60
Old range, nonbessemer	7.45
Mesabi, bessemer	7.35
Mesabi, nonbessemer	7.20
High phosphorus	7.20
After Dec. 31, 1948, increases or decreases in Upper Lake freight handling charges or taxes thereon to be for the buyers' account.	

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f.	7.9¢ to 9.0¢
New York, ocean bags....	
Domestic sponge iron, 98+% Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe	31.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe... ..	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.8%+ Fe.	90.0¢ to \$1.75
Aluminum	31.00¢
Antimony	51.17¢
Brass, 10 ton lots	27.25 to 37.25¢
Copper, electrolytic	33.625¢
Copper, reduced	34.25¢
Cadmium	\$2.40
Chromium, electrolytic, 99% min.	\$3.50
Lead	28.00¢
Manganese	60.00¢
Molybdenum, 99%	\$2.65
Nickel, unannealed	67.00¢
Nickel, spherical, minus 30 mesh, unannealed	68.00¢
Silicon	34.00¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.0¢
Tin	\$1.155
Tungsten, 99%	\$2.90
Zinc, 10 ton lots	17.75 to 22.25¢

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) ..	\$15.00 to \$15.50
Connellsville, Pa.	
Foundry, beehive (f.o.b. oven) ..	\$16.00 to \$17.50
Connellsville, Pa.	
Foundry, Byproduct	\$22.75 to \$23.10
Buffalo	20.40
Chicago, f.o.b.	19.40
Detroit, f.o.b.	23.35
New England, del'd	21.50
Seaboard, N. J., f.o.b.	21.05
Philadelphia, f.o.b.	21.00
Swedeland, Pa. f.o.b.	20.90
Painesville, Ohio, f.o.b.	21.50 to 23.50
Erie, del'd	22.45
Cleveland, del'd	21.50
Cincinnati, del'd	23.50
St. Paul, f.o.b.	20.98
St. Louis, del'd	18.66
Birmingham, del'd	

REFRACTORIES

(F.o.b. Works)

	Carloads, Per 1000
Fire Clay Brick	
First quality, Pa., Md., Ky., Mo. (except Salina, Pa., add \$5)....	\$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo.	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)....	11.50

	Per Net Ton
Silica Brick	
Mt. Union, Pa., Ensley, Ala.	\$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	85.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)... ..	\$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	14.75
Silica cement, net ton, bulk, Utah and Calif.	21.00

	Per Net Ton
Chrome Brick	
Standard chemically bonded, Balt., Chester	\$69.00

	Per Net Ton
Magnesite Brick	
Standard, Balt. and Chester	\$91.00
Chemically bonded, Balt. and Chester	80.00

	Std. 3/4-in. grains
Grain Magnesite	
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed	\$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines.....	\$30.50 to \$1.00
In sacks with fines.....	35.00 to 35.50

	Per Net Ton
Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk, Midwest, add 10¢; Missouri Valley, add 20¢... ..	\$12.25

PRICES

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, per 100 lb.
(Metropolitan area delivery, add 15¢ to base, except New York, add 20¢)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (16 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	\$5.15- 5.71	\$6.31- 6.57	\$7.27- 7.52	\$5.35- 5.68	\$6.51	\$5.37- 5.52	\$5.09- 5.24	\$5.35- 5.57	\$6.18- 6.31	\$9.14	\$9.29	\$10.54	\$10.69
New York	5.40- 5.98	6.28- 6.43	7.25- 7.89	5.58- 5.88	6.48- 6.73	5.78	5.32- 5.58	5.53- 5.63	6.18- 6.38	9.17- 9.53	9.32- 9.68	10.40- 10.77	10.55- 10.92
Boston	5.48- 5.64	6.39- 7.83	7.56- 7.83	5.54- 5.89	6.75- 6.79	5.74	5.39- 5.54	5.48- 5.59	6.24- 6.34	9.40- 9.44	9.55- 9.59	10.84- 10.94	10.92- 11.09
Baltimore	5.28	6.18	7.15- 7.38	5.34	6.79	5.53	5.33- 5.39	5.39	6.13	....	....	....	....
Chicago	4.85- 5.10	5.75- 5.95	7.10- 7.27	4.85- 5.30	6.52- 6.68	5.10	4.90	4.90	5.70	9.35	9.60	10.80	11.05
Milwaukee	5.03	5.93	7.27	5.03	6.80- 6.86	5.28	5.08	5.08	5.88	9.38	9.63	10.83	11.08
Norfolk	5.75	....	....	....	....	6.00	8.00	6.00	....	....	....	....	....
Cleveland	4.98- 5.20	5.75 ¹ - 6.04 ¹	7.18- 7.44	5.02- 5.65	6.70	5.35- 5.54	5.16- 5.42	5.15- 5.34	5.70- 5.95	9.14- 9.66	9.29- 9.89	11.05	11.30
Buffalo	4.85	5.75	7.65	5.56	6.35	5.35	5.10	5.05	5.90	9.70	9.95	11.15	11.40
Detroit	5.20- 5.55	6.05- 6.50	7.70	5.25- 5.70	6.25- 6.55	5.50- 5.55	5.30- 5.37	5.30- 5.52	6.02- 6.07	9.31- 9.55	9.20- 9.47	10.72- 10.95	10.87- 11.10
Cincinnati	5.14- 5.36 ⁸	5.82- 6.21 ⁸	6.97- 7.65	5.25- 5.62 ⁸	6.31	5.50- 5.71 ⁸	5.30- 5.47 ⁸	5.30- 5.62 ⁸	6.06- 6.17 ⁸	9.31- 9.35	9.50- 9.51	10.75- 10.78	10.90- 10.91
St. Louis	5.19	6.04- 6.09	7.29- 7.64	5.19- 5.79	6.49	5.39- 5.44	5.24	5.24	6.04	9.69	9.94	11.14	11.39
Pittsburgh	4.85- 4.90	5.75 ¹ - 6.09	7.15	5.00- 5.35	5.95	5.05- 5.25	4.90- 5.15	4.90- 5.10	5.65- 5.80	9.35	9.60	10.40	10.55- 10.80
St. Paul	5.44	6.34	7.33- 7.74	5.44	....	5.69	5.49	5.49	6.29	9.84	10.13	11.39	11.64
Omaha	5.92	....	9.18	5.92	....	6.17	5.97	5.97	6.77	....	....	....	....
Birmingham	5.05 ¹	....	6.45	5.05 ¹¹	6.68	5.25 ¹¹	5.00 ¹¹	5.00 ¹¹	6.68	....	....	....	....
Houston	6.40	....	8.80	6.75	....	6.35	6.20	6.40	7.60	9.80	9.65	10.75	10.95
Los Angeles	6.30- 6.40	7.85 ¹ - 7.90	7.95- 8.90	6.60- 6.86	9.35 ⁸	6.10- 7.40	5.75- 5.90	6.05	7.85 ¹⁵ - 8.48	10.90	10.85	12.40	12.68
San Francisco	5.95 ⁸	7.15 ² - 8.90	8.25- 8.45 ²	6.75 ⁸	8.25	6.30- 7.60	5.90- 6.90	5.90	7.55	10.90	10.85	12.40	12.65
Portland	6.50 ⁴	8.00 ² - 8.45 ²	8.15 ² - 8.45 ²	6.86 ⁴	....	6.30 ⁴	6.25 ⁴	6.25 ⁴	8.25 ⁴	....	10.45 ¹⁵	....	12.05 ¹⁵
Seattle	6.20 ⁴ - 6.30 ⁴	7.75 ² - 7.85 ²	7.65- 8.00	8.55 ⁴ - 6.65 ⁴	....	6.20- 6.30	6.15- 6.25	6.05 ⁴ - 6.15 ⁴	8.00 ¹⁴ - 8.10 ¹⁴	....	10.30 ¹⁵ - 10.40 ¹⁵	....	12.00 ¹⁵ - 12.05 ¹⁵
Salt Lake City	7.05- 8.00	8.20	7.80- 8.06	7.10- 7.69	....	5.75- 6.65	6.65- 7.00	6.95- 7.25	7.55- 8.40	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED:

Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED:

Sheets, 400 to 1999 lb; strip, extras on all quantities bars 1000 lb and over.

ALLOY BARS:

1000 to 1999 lb.

GALVANIZED SHEETS:

450 to 1499 lb.

EXCEPTIONS:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight nor the 6 pct increase on total freight charges in the Eastern Zone (5 pct Southern Zone, 4 pct Western Zone), effective Jan. 11, 1949.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	....	....	....	....
Birmingham	42.88	43.38	....	....	....
Buffalo	47.00	47.00	47.50	....	....
Chicago	46.00	46.50	46.50	47.00	....
Cleveland	46.00	46.50	46.50	47.00	51.00
Duluth	46.00	46.50	46.50	47.00	....
Erie	46.00	46.50	46.50	47.00	....
Everett	....	52.75	53.25	....	....
Granite City	47.90	48.40	48.90	....	....
Ironton, Utah	62.00	62.50	....	....	....
Lone Star, Texas	....	75.00	....	....	....
Neville Island	48.00	48.50 [†]	48.50	....	....
Provo	48.00	48.50	....	....	....
Sharpville	48.00	48.50	48.50	47.00	....
Steeltown	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio	48.00	....	....	....	....
Swedeland	50.00	50.50	51.00	51.50	....
Teledo	46.00	46.50	46.50	47.00	....
Troy, N. Y.	....	....	....	....	54.00
Youngstown	48.00	48.50	48.50	....	....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	\$0.50 Arb.	....	52.75	53.25	....	....
Boston	Steeltown	6.27	54.27	54.77	55.27	55.77	60.27
Brooklyn	Bethlehem	3.90	51.90	....	....	....	....
Cincinnati	Birmingham	6.09	48.97	49.46	....	....	....
Jersey City	Bethlehem	2.39	50.39	....	....	....	....
Los Angeles	Provo	6.93	52.93	53.43	....	....	....
Mansfield	Cleveland-Toledo	3.03	49.03	49.53	49.53	50.03	54.03
Philadelphia	Bethlehem	2.21	50.21	....	....	....	....
Philadelphia	Swedeland	1.31	51.31	51.81	52.31	52.81	....
Philadelphia	Steeltown	2.81	50.81	51.31	51.81	52.31	56.81
San Francisco	Provo	6.93	52.93	53.43	....	....	....
Seattle	Provo	6.93	52.93	53.43	....	....	....
St. Louis	Granite City	0.75 Arb.	48.85	49.15	49.85	....	....

† Low Phos, Southern Grade.

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00

pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio —\$59.50; f.o.b. Buffalo \$60.75. Add \$1.25 per ton for each additional 0.50 pct Si. up to 12 pct. Add 50¢ per ton for each 0.50 pct

Mn over 1.00 pct. Add \$1.00 per ton for 0.70 pct or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$66.00 per gross ton, f.o.b. Lyles, Tenn. Delivered Chicago, \$73.78. High phosphorus charcoal pig iron is not being produced.

FERROALLOY PRICES

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size.	
F.o.b. Birmingham	\$162
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	\$160
F.o.b. Johnstown, Pa.	\$162
F.o.b. Sheridan, Pa.	\$160
F.o.b. Etna, Pa.	\$163
\$2.00 for each 1% above 82% Mn; penalty, \$2.00 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.0
Ton lots	11.6
Less ton lots	12.5

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn	19-21% Mn
3% max. Si	3% max. Si
Palmerton, Pa.	\$61.00
Pgh. or Chicago	\$62.00
	65.00
	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06%			
P, 90% Mn.	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C			
7.00% max. C	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C.	
Carload bulk	8.60
Ton lots	10.25
Briquet, contract basis, carlots, bulk delivered, per lb of briquet	10.0
Ton lots	11.6
Less ton lots	12.5

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct., f.o.b. Keokuk, Iowa, openhearth \$84.00, foundry, \$85.00; \$84.75 f.o.b. Niagara Falls; Electric furnace silvery iron is not being produced at Jackson. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50 pct. Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe.	20.70
97% Si, 1% Fe.	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.	
25% Si	13.50
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast Turnings	Distilled
Ton lots	\$2.05	\$2.95
Less ton lots	2.40	3.30
		4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si)

0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35
Briquets—Contract price, cents per pound of briquet, delivered, 60% chromium.	
Carload, bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.	
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carload	21.60
Ton lots	23.75
Less ton lots	25.85
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carload	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, cents per lb. chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.	
0.20% max. C	1.09
0.50% max. C	1.05
9.00% min. C	1.04

Calcium—Silicon

Contract price per lb. of alloy, lump, delivered.	
30-33% Ca, 60.65% Si, 3.00% max. Fe.	
Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.	
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	
Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	
Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.	
Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 53%, Ti 9 to 11%, Ca 5 to 7%.	
Ton lots and carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7 Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.	
Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	\$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained, V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V ₂ O ₅ contract basis, per pound Contained V ₂ O ₅	\$1.20
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Nb.	
Ton lots	\$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.10
Calcium molybdate, 45-50%, f.o.b. Langeloth, Pa., per pound contained Mo.	96¢
Molybdenum oxide briquets, f.o.b. Langeloth, Pa., per pound contained Mo.	95¢
Ferrotitanium, 40%, regular grade, 10% C max., f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	\$1.28
Ferrotitanium, 25%, low carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	\$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads, per net ton	\$160.00
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 untag, per gross ton	\$65.00
10 tons to less carload	75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per pound of alloy.	
Carload, bulk	6.60¢
Alstifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	8.90¢
Ton lots	9.80¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk	11.00
Ton lots, packed	11.25
Less ton lots	11.75
Boron Agents	
Contract prices per pound of alloy, delivered.	
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D.	
Ton lot	\$1.20
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. X D, delivered.	
Ton lots	\$1.67
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	\$1.80
Silcaz, contract basis, delivered.	
Ton lots	45.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortam, f.o.b. Niagara Falls	45¢
Ton lots, per pound	50¢
Less ton lots, per pound	
Carbortam, f.o.b. Suspension Bridge, N. Y., freight allowed, Ti 15-18%, B 1.00-1.50%, Si 1.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	\$6.25

(CONTINUED FROM PAGE 136)

- **C. S. Stuckenholt**, vice-president in charge of sales, has been elected president of the **W. J. Schoenberger Co.**, Cleveland, a subsidiary of the **Bell Aircraft Corp.** Mr. Stuckenholt succeeds **W. J. Schoenberger**, who resigned.
- **Arthur M. Killin** has been named assistant superintendent of the **Niagara Falls plant** of **Union Carbide & Carbon Corp.**, succeeding **LaMont McClincy**, who has been appointed assistant superintendent of the company's **Ashtabula, Ohio, plant**.
- **Joseph F. Lask** has been appointed general manager and **John L. Bradford**, sales manager, **Modern Collet & Machine Co.**, Ecorse, Mich. Mr. Lask recently resigned as factory manager of **Gairing Tool Co.** to join **Modern Collet**. Mr. Bradford has been a factory representative with the company since 1945.
- **Dan O'Madigan, Jr.**, has been appointed assistant general sales manager of the **Pontiac Motor division**, **General Motors Corp.**, Pontiac, Mich., and has been succeeded as **Memphis zone manager** by **James P. Carper**, who had served as assistant zone manager at Atlanta. **E. J. Chapman**, manager of the **Pontiac zone**, has been appointed regional manager there. **Gerard J. Schulte**, **Kansas City zone manager**, has replaced Mr. Chapman as manager. **Byron A. Kortier**, assistant zone manager in **Kansas City** assumes Mr. Schulte's former post as zone manager and is replaced by **Gilbert A. Wiggins**, formerly service manager at Cincinnati. **Ira J. Woodfin**, business management manager at **Memphis**, replaces Mr. Carper as assistant zone manager at Atlanta. **H. C. Pratt**, parts and accessories merchandising manager at **Omaha** has been appointed assistant zone manager at **New York**, replacing **E. M. Krotine**.
- **Brooks M. Dyer** has been appointed **St. Louis district sales manager** for the **Columbia chemical division**, **Pittsburgh Plate Glass Co.**, Pittsburgh. Mr. Dyer has been associated with the **Columbia division** since 1943. He succeeds **Vernon L. Clark** who has been assigned to special sales duties.
- **George R. Gibbons**, senior vice-president and director of the **Aluminum Co. of America**, Pittsburgh, has retired as an officer of the company. He continues as a member of the board of directors. **Kent R. Van Horn** has been named assistant director of research. Dr. Van Horn had formerly served as head of the **Cleveland branch** of the **Aluminum research laboratories**. **Maurice W. Daugherty**, assistant chief of the **Cleveland laboratories**, succeeds Dr. Van Horn as chief.
- **James Clarke**, director of audits for the **Westinghouse Electric Corp.**, Pittsburgh, has been elected assistant controller. **William E. Shoupp** has been named director of research and **Robert A. Bowman**, manager of engineering, in the new atomic power division. Dr. Shoupp had formerly served as manager of electronics and nuclear physics research, while Mr. Bowman had been manager of condenser engineering at the steam division in **South Philadelphia, Pa.** **J. C. Fink** has been named manager of the industry engineering department of **Westinghouse**. **F. R. Benedict** has been made manager of the headquarters engineering department. **J. F. Walsh** has been made sales manager of the home radio division, succeeding **E. G. Herrman**, who resigned.
- **Frank Edwards** has been promoted to sales manager of the heater division of **Eaton Mfg. Co.**, Cleveland. Mr. Edwards has been associated with this division since 1946 when he joined it as sales engineer.
- **George H. Hodges** has been appointed manager, **Marine Dept.**, **Babcock & Wilcox Co.**, New York. **William M. Firshing** has been transferred from the **Marine Dept.** to assist the vice-president in such duties as may be assigned. **George A. Mattucci** has been made assistant manager and **Edward L. Boland**, assistant to manager of the **Marine Dept.** **Calvin H. Lawrence** has been appointed marine manager for the **Great Lakes district**.
- **Benjamin H. Askew** has been named assistant to the controller, **International Business Machines Corp.**, New York. Mr. Askew joined the company in 1940 and since early in 1948 has served as **IBM manager** in **Raleigh, N. C.**
- **Fred E. Link** has been appointed general works manager, **Oil Well Supply Co.**, Dallas. Mr. Link, who for the past year has served as assistant to the president in charge of the manufacturing department, continues in Dallas as the chief company official in charge of manufacturing activities. He joined the company in 1946.
- **E. G. Bergren** has been named general manager of the **Taylor & Spotswood Co.**, San Francisco. **John D. Smart** has been appointed to succeed Mr. Bergren as manager of purchases for that company, and **William C. Tagmyer** succeeds Mr. Smart as manager of the tubular division.
- **Arthur M. Swigert** has been appointed vice-president in charge of manufacturing operations of **Universal Products Co.**, Dearborn. Mr. Swigert had formerly been associated with the **Chrysler Corp.** and **Ingalls Shipbuilding Corp.**, and served as master mechanic at the **Detroit Tank Arsenal**.
- **Thura A. Engstrom**, vice-president of **Continental Motors Corp.**, Detroit, has been named works manager of the company's aircraft, automotive and industrial engine division. **Ed Kring** has been made factory manager, having previously served as division superintendent. **R. D. Johnson** has been promoted from production manager to assistant factory manager and **Robert Bird**, formerly supervisor of schedules, has been appointed production manager.
- **Frank H. Reynolds** has been named vice-president of **Continental Equipment Corp.**, New York. Mr. Reynolds started his long career in the locomotive industry in 1903 with the **Delaware & Hudson R. R.** and has since served with the **American Locomotive Co.**, the **Baldwin Locomotive Works** and **American Locomotive Co.**
- **George Gibbs** has retired from his association with **A. M. Castle & Co.**, Chicago. Mr. Gibbs had been with the organization since 1945 when it acquired the **Gibbs Steel Co.**, where he served as president.
- **R. M. Ryan** has been named **Buffalo representative** of **Cincinnati Industries, Inc.**, Cincinnati.